EVALUATING PREVENTION STRATEGIES USED BY GENERAL PRACTITIONERS IN GRAHAMSTOWN IN TERMS OF RECOMMENDED GUIDELINES

A study conducted in partial fulfilment for the degree MMed (Fam Med), Stellenbosch University

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Declaration:
"I, the undersigned, hereby declare that the work contained in this assignment is my original work and that I have not previously submitted it, in its entirety or in part, at any university for a degree."

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CONTENTS

ABSTRACT (Summary)

Background: Increasing attention has been paid to preventative health over the past few decades. However because of constraints on consultation time and medical funds general practitioners (GPs) are often unsure which measures are appropriate and when to carry them out. They need to be well informed about the cost-effectiveness and evidence regarding each preventative measure to help their patients make informed choices about what needs to be done. Due to the large number of recommended screening measures general practitioners are often unsure which to prioritise and also forget to carry out all recommended measures. Recommendations for screening in South Africa and research into preventive strategies used by general practitioners are lacking. This research attempts to find out whether the prevention strategies used by general practitioners in private practice in Grahamstown follow recommended guidelines.

Methods: To obtain a broad understanding of prevention strategies used by general practitioners in Grahamstown, the following tracer conditions were selected for the study: screening for smoking, breast cancer, cervical cancer, colorectal cancer, hyperlipidaemia, prostate cancer and human immunodeficiency virus (HIV) infection. Research on routine annual health checks was included as these are used by many GPs to screen for tracer conditions. The research was done in 2 parts: 1. Review of the literature to obtain evidence on the recommended prevention strategy for each of the selected tracer conditions and 2. Interviews with GPs to evaluate the prevention strategy they used for each tracer condition. The literature was reviewed for evidence on the following parameters for each tracer condition: burden of the disease prevented; cost-effectiveness of the screening measures; sensitivity and specificity of screening tests; whether the screening measure for and treatment of the tracer condition is acceptable to patients; appropriate duration between repeated screening tests and whether there is effective treatment for the tracer condition. Eleven general practitioners were interviewed on the prevention strategies they use for each of the selected tracer conditions. Transcriptions of the interviews were analysed qualitatively and qualitatively. The prevention strategies used by the general practitioners was then compared to recommended guidelines.

Results: Evidence from the literature regarding the burden of and optimal prevention strategy for each tracer condition is reported. Using this evidence an appropriate prevention strategy for each tracer condition is outlined. The prevention strategies used by the GPs for each tracer condition and the routine annual health check is reported from the analysis of the interviews. The results show a wide range of differing strategies used by the GPs, often not following recommendations from research.

Discussion: The prevention strategies used by general practitioners for each tracer condition is compared with the recommendations from the literature. Important differences between what are recommended and what general practitioners are doing is discussed. Some general practitioners are practicing largely curative medicine and are not adequately screening their patients. Others are over screening with too many unnecessary tests being done annually as a routine. The interviews reveal that generally GPs do not discuss the potential harms and limitations of screening tests with their patients; do not keep check lists for each patient and do not use registers or recall systems to ensure all screening is done.

Conclusion: General practitioners need to ensure their prevention strategies follow recommended guidelines. To do so they can use the routine annual health check or opportunistic case finding and prevention. They need to ensure that routine health checks are targeted to the individual patients' health risks and avoid doing unnecessary tests. Check lists can help to ensure all screening is done on every patient. While registers and recall systems improve screening rates they are not always possible in busy general practices. Recommended prevention strategies for each of the tracer conditions are made.

INTRODUCTION

Traditionally the main role of general practitioners (GPs) has been to treat illness. However internationally there has been increasing attention paid to prevention strategies over the past few decades. This has resulted in an ever increasing number of recommended screening preventative measures for family physicians to include in their consultations. In the private sector the increasing number of patients on managed care and other pressures to see patients as quickly as possible means there is pressure on GPs to spend less time on preventative measures to promote health. With constraints on consultation time and medical funds it is difficult to be sure which measures are appropriate and when to carry them out. GPs need to be well informed about each preventive measure and help their patients make informed choices about which need to be done. Preventive measures are an important part of primary health care but as health spending has become such an important issue, screening needs to be cost-effective and evidence based.

Research shows that half of the deaths due to heart disease, cancer, stroke and chronic obstructive pulmonary disease are potentially preventable with simple measures like stopping smoking, diet and exercise.[1] Patients are reluctant to heed advice to live healthy lifestyles and patient education is the most poorly carried out function by doctors. Disadvantaged communities tend to be given preventive services at an even lower rate.

General practitioners need to be well informed about each screening test to ensure they can advise their patients appropriately. Ideally screening tests should be highly sensitive and specific. Those at risk must be willing to take part in the screening measure and find the treatment of the condition acceptable. Screening intervals must be shorter than it takes for the illness to become untreatable and early treatment must be effective. Practitioners must also be aware of the advantages and disadvantages of screening. Advantages include better prognosis and easier treatment of cases detected early and reassurance for patients with negative results. Disadvantages can be a longer period of morbidity if the prognosis is unaltered, unnecessary treatment of doubtful or false positive results, false reassurance for those with false negative results and increased stress with false positive results. Doctors must explain these advantages and disadvantages and any other risks or implications before recommending a screening measure.

Because doctors were unsure which screening tests to recommend, the Canadians set up a task force in the 1970's to research guidelines for preventive measures in clinical practice.[2] Reviewing medical evidence they identified conditions and risk factors that were most suitable for preventive measures. The Americans followed suit with the United States Preventive Services Task Force (USPSTF).[3] This task force continues to report on scientific evidence and makes recommendations regarding preventive measures. General recommendations regarding screening they have made are:

1. Interventions should focus on each patient's particular health practices.
2. Patients should be involved in making decisions about screening.
3. There must be evidence that preventive measures being used are effective.
4. Doctors should try and discuss prevention at every consultation with their patients.
5. Some preventive measures are best dealt with at a community level rather than by individual doctors.[3]

The USPSTF has made recommendations on an extremely large number of preventive measures such that GPs are unsure which measures to prioritise. Ashley and Coffield did an interesting assessment of 30 clinical preventive services recommended by the USPSTF. They valued the services based on the burden of the disease prevented and cost-effectiveness of the service and then put them in ranking order. To prioritise which services needed improved delivery they compared the ranking with known delivery rates. They found several preventive measures with a high ranking but low delivery rate.[4]

Smith and Herbert assessed the practice of preventive measures by GPs in British Columbia compared to Canadian Task Force recommendations. They sent a questionnaire to 300 GPs asking about preventive measures for 4 common cancers-cervix, breast, lung and colon. They found that the GPs did not follow recommendations properly; they tended to comply with traditional measures recommended but also persisted with traditional measures no longer recommended and did not adopt new recommendations.[5] A study using practice nurses to record the delivery of preventive services by family physicians showed a wide variety of delivery rates during routine health visits and low rates during visits for illness. Only 55% of screening measures and 9% of counselling for unhealthy habits were up to date.[6]

Apart from being unsure which measures to recommend doctors often forget to carry them out. Dubey and Glazier developed preventive guidelines for adult care in the form of checklists (one for females and one for males) for family physicians in Canada. They researched evidence on recommended preventive measures and drew up checklists of those which are practical for family physicians to carry out. Some of the measures are not evidence based but are carried out routinely in practice. They claim the forms are cost effective and easy to use.[7] In a randomized controlled trial to assess their effectiveness it was found that carrying out preventive measures by family physicians improved with the use of these checklists.[8]

There are many barriers to practitioners carrying out screening and prevention. Reviewing literature Wender tried to identify what these barriers are. He found 3 types of obstacles: practitioner-specific, patient-specific and health system barriers. Practitioner-specific obstacles he found were lack of time, competition with other health needs, disagreement with recommendations and lack of expertise. Patient-specific obstacles were refusal to test and insufficient funds. Health system obstacles were inadequate insurance, space or staff. He concludes that to improve screening practitioners must be helped to identify and overcome barriers.[9]

Yarnall et al researched the time required for a GP to carry out recommended preventive services on an average number of patients seen each day. They found a doctor would need 1773 hours a year (7.4 hours per day) to provide all the services graded A or B recommended by the USPSTF.[10] Pimlott points out that "*the number of recommended prevention strategies grows each passing year making it increasingly difficult for family physicians to find time to implement them*". He notes that these recommendations come from various interest groups and do not always have good evidence to support their use. He also found that the media increased public demand for some screening measures and that family physicians are faced with spending a great deal of time trying to explain the evidence regarding screening measures or doing what the patients demand to save time. Pimlott states that preventive measures need to be prioritised so family physicians know how much time to spend on each and that the public must be involved in deciding how these should be carried out. He goes on to question whether doing prevention when patients have visited for another illness should still be recommended and is even ethical.[11]

There is not much research on recommended preventive measures for South Africa or on the preventive strategies used by GPs in South Africa. This research attempts to find out whether the prevention strategies used by general practitioners in private practice are appropriate and follow recommended guidelines. As there are no specific protocols or guidelines for screening in general practice in South Africa, it is possible that screening strategies used by GPs vary a great deal and often do not follow what is recommended.

The aim of this study was to evaluate the prevention strategies used by general practitioners in Grahamstown in terms of the recommended guidelines for selected tracer conditions. In this study prevention strategies used by GPs for each tracer condition means what screening tests or measures they use; what age they recommend their patients do the screening tests; how often these are repeated; when they carry out screening (opportunistically or on a routine basis during routine annual health checks for instance); whether patients are informed about the advantages, benefits, disadvantages and harms of each screening measure and whether

they use check lists or registers as reminders to ensure all patients are screened appropriately. This study, unless otherwise stated, refers to screening or prevention strategies only on normal healthy people without risk factors for or symptoms of the tracer condition. Prevention strategies for this study means the screening measures used to detect the tracer condition. Where interventions are an integral part of the screening process, for instance smoking cessation advice when screening for smoking, these have also been researched as part of the prevention strategy.

Grahamstown is a small town in the Eastern Cape with a population of approximately 175 000 people. There are 16 private general practitioners working in Grahamstown. The practice profile of two of the GPs is largely disadvantaged poor patients whereas all the other GPs attend to a wide spectrum of the community from the very poor to the wealthy.

The objectives of the study were to:

1. Select appropriate tracer conditions for general practice in Grahamstown and research the literature for recommended prevention strategies for these conditions.
2. Get a broad understanding of the prevention strategies used by GPs in Grahamstown for these tracer conditions.
3. Compare the prevention strategies used by the GPs with recommended guidelines.
4. Make recommendations for appropriate screening in general practice in Grahamstown.

METHODS

The following tracer conditions were selected for this study:

- Screening for smoking
- Screening for breast cancer
- Screening for cervical cancer
- Screening for colorectal cancer
- Screening for hyperlipidaemia
- Screening for prostate cancer
- Screening for human immunodeficiency virus (HIV) infection

These conditions were chosen as a review of the literature showed them to be important common conditions that should be screened for in adults in general practice. Because of limitations to the size of the research and the length of interviews with general practitioners more tracer conditions could not be included. Fewer tracer conditions researched in more depth would not have given a broad understanding of the screening strategies used by GPs. The choice of these tracer conditions was discussed with two GPs in private practice in Grahamstown and both agreed these conditions should be screened for routinely and screening measures for these are well known in general practice. They suggested that research on routine annual health checks be included as these are used by many general practitioners to screen for all of these tracer conditions on an annual basis. This would give a good general overview of the prevention strategies used by GPs to screen for all tracer conditions.

The research was done in 2 parts: 1. Review of the literature to obtain evidence on the recommended prevention strategy for each of the selected tracer conditions and 2. Interviews with GPs to evaluate the prevention strategy they used for each tracer condition.

1. Literature review

Research of the literature was conducted to determine recommended prevention strategies for each of these tracer conditions. A large number of studies; mainly randomized controlled trials, systematic reviews, meta-analyses and task group reports were used to find reliable evidence. While researching the literature evidence on some of the following parameters, based on the World Health Organisation's criteria for disease screening[14], were looked for:

- The burden of the disease prevented.
- The cost-effectiveness of the preventive measure.
- The sensitivity and specificity of screening tests.
- Whether patients will find the preventive measure and treatment of the tracer condition acceptable.
- The appropriate duration between repeated screening tests.
- Whether there is effective treatment for the tracer condition.

2. Interviews with general practitioners

Interviews using structured questionnaires were carried out with GPs in Grahamstown to evaluate the prevention strategies they use for the selected tracer conditions and routine annual health checks. They were asked whether they recommended routine annual health checks and used these to screen for tracer conditions. They were then asked about different aspects of the routine annual health check and prevention strategies for each of the tracer conditions selected. The interviews were piloted on two general practitioners. These pilot interviews revealed that generally the questions were appropriate to evaluate the prevention strategies used by GPs. The respondents of the pilot interviews gave positive feedback and did not feel the interviews needed changing much. However they did comment that the interviews were a bit long and they were getting tired towards the end. Therefore the number of questions on each preventative measure was reduced. (See Addendum 1 for structured questionnaire used for the interviews with GPs). Repetition was avoided in the

interviews by recognising patterns of screening and not repeating similar questions about the different screening measures. GPs were asked what their prevention strategy was for each tracer condition and if they gave a comprehensive answer were then not asked specific questions about each detail of their screening strategy. A few general questions were asked at the end of each interview to get an overview of each GP's approach to screening

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The study population was the private general practitioners in Grahamstown. Those GPs involved in selecting tracer conditions and piloting the interviews were not included. As many of the rest of the GPs in Grahamstown who were prepared to take part, were included to make the results as representative as possible. There were no exclusion criteria. As basic principles apply to all general practices and the patient demographics of the GPs in Grahamstown include a wide spectrum of patients the study population was chosen as a possible representative sample of private general practice in South Africa. It is possible that the results are relevant to GPs in private practice throughout South Africa because strategies used by the study population reflect those used by many others in the country.

Thirteen GPs were contacted telephonically to request an interview. Eleven of them obliged immediately and arranged a time for the interview. Two GPs said they would arrange a time for an interview but never did. All the GPs who agreed to an interview did not mind being recorded. Six of the GPs practice together, 3 are solo general practitioners and 2 are from a small group practice. Two of the GPs serve poor communities and the rest serve a broad cross section of the community. The six from the same practice did not have very similar prevention strategies. The only screening measure which they practiced similarly was doing annual PAP smears because they had all been advised by the same gynaecologist to do so. The 11 GPs were given information leaflets and consent forms (Addendum 2) to read and sign before the interview.

Each interview took between 30 to 45 minutes. The GPs all showed signs of getting bored or tired by the end of the interview. One interview was interrupted near the end as the GP was called to an emergency and was unable to complete the interview. The GPs were all very open and relaxed and soon after starting the interviews seemed to forget they were being recorded. None of the GPs seemed to feel they were being assessed about how much they knew and were quite happy to acknowledge they did not know about something when this was the case. They all seemed to give an honest account of what they actually do in practice. Some were interested in and asked about recommendations they felt unsure about. An attempt was made by the researcher not to ask questions in such a way that indicated to the GPs how things should be done. All the GPs gave their opinions openly and did not seem inhibited in the interviews. Because the researcher was a GP interviewing other GPs sometimes the respondent would not answer the question completely because he/she felt the researcher had an understanding of what was being meant. This may have lead to some information being missed.

During the interviews patterns of practice or opinion were looked for and then checked for in subsequent interviews. The interviews were transcribed anonymously by a typist from the recordings. The transcribed data was analysed qualitatively by grouping information from each of the interviews on the different tracer conditions together. This data was analysed on the prevention strategy used and the views of the GPs regarding screening for each tracer condition. Themes or similar strategies and opinions on each condition were looked for like whether GPs used routine annual health checks or opportunistic case finding as a general prevention strategy; whether they used check lists or registers and if they found it necessary to explain the potential benefits and harms of screening tests to patients. The response from each GP was then compared with all the other responses. An attempt was made to determine why certain strategies are used. Interesting comments or opinions from the GPs which revealed why they do things in a certain way was looked for. While this was largely a qualitative study some of the data from the interviews required quantitative analysis like the number of GPs using the same preventive strategy for a tracer condition.

Ethically the researcher needed to ensure privacy of the information given by the general practitioners. This was done by recording the interviews privately, not attaching names to the recordings and ensuring that the data was transcribed and analysed anonymously. The recordings were destroyed after transcription and no names are mentioned in the research report. Informed consent was obtained from the GPs to conduct interviews. An explanation was given to participants why the research was being done and how the interviews would be conducted. It was pointed out that if they felt uncomfortable they were free to withdraw from the research at any stage. The research was passed by the ethics committee at the University of Stellenbosch.

The strength of this study was to research good quality evidence for recommendations on screening strategies for each selected tracer conditions. This makes the data reliable and valid. However as several tracer conditions were included in the study the depth of information and debate regarding recommended prevention strategies for each was limited. Instead of an in depth analysis of screening strategies for one or two tracer conditions the study provides a broader overview of prevention strategies in general practice. Including research on interventions for some of the tracer conditions makes the study less focussed but also leads to a broader understanding of prevention strategies used by GPs.

Reliability of the information given by the GPs during the interviews may have been affected by the fact that the researcher's relationship with each GP is different and that some of the GPs may have felt their work was being assessed and therefore give answers that they think are correct rather than what they actually do in practice. However these problems did not occur significantly as the GPs all answered questions very openly and honestly resulting in reliable data. Limitations on time available to GPs for interviews and the large number of tracer conditions included in the study resulted in limitations on the amount of information obtained from the interviews.

As the researcher is a general practitioner in the same working environment as the GPs being studied the validity of answers given during interviews was easily assessed. Validity of the study results is also improved by clearly describing how it was collected and analysing the transcribed words of those interviewed. Direct quotes are reported, where appropriate, to express the opinions of GPs accurately. However the validity of the data is limited by the fact that only one researcher analysed the data and triangulation was not done.

RESULTS

The findings of the literature review on recommended prevention strategies and the results obtained from the interviews with GPs on their prevention strategies will be reported for each tracer condition in turn.

Routine annual health check

a) Literature review: Recommendations on the routine annual health check

There is controversy in the literature regarding the value of routine physical examinations on healthy people. Some feel routine health examinations should be targeted to the specific risks of each individual. Prochazka et al found, in a survey of 783 primary care physicians, 88% perform routine examinations. Most of the clinicians (74%) felt the routine health check detected sub-clinical illness although evidence does not support this. Many included screening tests as a routine in these medical check ups despite there being no evidence to support doing these tests annually as a routine. Most found the annual physical examination gave them time to discuss preventive health issues (94%) and improved their relationship (94%) with their patients. They (78%) also felt that most patients wanted the examination.[12] In a systematic review of the value of the routine annual health check it was found that this increased the delivery of gynaecological examinations, PAP smears, cholesterol testing and faecal occult blood tests[13]. It also showed that routine health checks reduce patient worry about illness. However the researchers state that more research is needed to assess the long term benefits, harms and cost effectiveness of routine health checks[13].

Recommendations: From the literature it is difficult to recommend whether GPs should do routine annual health checks or not. However it is a useful examination to ensure all necessary screening is done and patients generally want them to be done. Prevention needs to be done opportunistically and by case finding if GPs decide not to do routine annual health checks.

b) Interview results: Strategies used by GPs in Grahamstown regarding the routine annual check up

Analysis of the responses from the interviews shows that some GPs do not recommend routine annual check ups to their patients. The reasons for not doing this seem to vary. Some practice mainly curative medicine and acknowledge they do not focus much on preventative care while others do not believe there is value in the routine annual check up. One GP said he felt the routine health check was not a "*directed approach to solving problems*" and he preferred a more directed or targeted approach to helping patients. He also felt there is "*low pick up*" of disease with these routine health checks. The GPs who do not recommend routine health check ups seem to do their screening in a targeted way by recommending tests to patients with specific risks or when they have symptoms associated with a tracer condition. For example recommending PAP smears to women when they present with gynaecological symptoms. Those GPs who do not recommend routine annual check ups do them if the patient requests it. None of the GPs dissuaded their patients or refused to do annual check ups. One of the GPs had many requests for annual checks ups although she did not believe these were valuable. The reasons for doing the routine health check although they did not recommend it varied. One felt it was the "*patient's right to know they are healthy*" and that he would do it to "*reassure the patient*". One GP gave the following reason: "*I would do it because patients in private practice would not understand if you said no and think you are being a bad doctor. So I do it for public relations really, not for health benefits*".

Six of the 11 GPs interviewed strongly recommended annual health check ups. The age they recommend patients start these check ups vary. Most start screening women at about age 20 or from when they become sexually active because they need PAP smears. Most recommend routine health checks begin on men over the age of 40 years. None of the GPs have a register or recall system. The patients are left to remember to

return for their annual check up. Some recommend to their patient they come in the month of their birthday as a way of remembering to have it done. The GPs who do recommend annual check ups feel there is value beyond picking up tracer conditions. They feel it is an opportunity when the patient focuses on their health and lifestyle; it is an opportunity to discuss prevention; it gives the doctor the opportunity to get to know their patient better and improves the doctor patient relationship. The GPs who recommend annual check ups tend to have a standard screening strategy rather than focusing on the individuals particular health practices. They include a wide range of tests in these annual check ups. Most do urine testing, ECG, urea and electrolytes, full blood count, glucose, lipogram and PSA in men and Pap smear and breast examination in women. Some include liver function tests, thyroid tests, rectal examinations on men and vaginal examinations on women in these annual check ups. Most of those GPs who recommend annual health checks say they have picked up medical conditions like high cholesterol and cancer of the prostate. Others feel they pick up very little pathology but do the annual check up because of the other benefits described above. Many of the GPs who do routine annual checks book their patients for a prolonged consultation for these to give them time to address all appropriate prevention issues. One GP stated he found the annual check allows him "*to get a good feeling for where his patient is health wise and mood wise without necessarily picking up any aberrant pathology*". Every GP seems to have a group of patients who demand routine annual checks. GPs do not involve their patients in discussions about the potential benefits and harms of these check ups, instead they get on and do them. All the GPs noted that routine annual check ups are done infrequently amongst their more disadvantaged patients.

Screening for smoking

a) Literature review: Recommendations on screening for smoking

Screening for tobacco use and encouraging patients to stop smoking is primary prevention to prevent diseases like stroke, heart and lung disease. In those patients who already have these conditions it may be considered part of tertiary prevention to prevent further deterioration.

Smoking is a serious public health problem increasing the risk of many diseases and thus the burden of disease justifies screening. There are an estimated 1.2 billion smokers worldwide, of which half will die prematurely of a disease caused by their smoking, losing on average 8 years of their lives[15]. It is especially important in South Africa because, although smoking is on the decline in developed countries it is increasing rapidly in low and middle income countries, especially among disadvantaged groups[15]. The South African Comparative Risk Assessment Collaborating Group estimated the burden of disease due to smoking in South Africa in 2000. They found that smoking caused between 41 632 and 46 656 deaths (8-9% of deaths) and 3.7-4.3% of disability adjusted life years in 2000[16]. Smoking was the third highest risk factor for mortality after unsafe sex and high blood pressure. Three times as many males as females died from smoking. They conclude that smoking causes a large burden of preventable disease in South Africa and should be a major public health priority[16].

Diseases associated with smoking are numerous. The strongest associations are with lung and heart disease, especially lung cancers, chronic obstructive pulmonary disease and ischemic heart disease[15]. The onset of these diseases usually occurs after many years of smoking and therefore there is a long pre-symptomatic phase which provides an opportunity for intervention. General practitioners have different beliefs about the effectiveness of smoking cessation interventions. Many general practitioners have negative beliefs and attitudes towards smoking cessation interventions like they are too time consuming and ineffective[17]. Many do not feel confident in their ability to discuss smoking with their patients or find such discussions unpleasant[17]. Other barriers to general practitioners getting involved in smoking cessation are concerns about patients being too sensitive about discussing smoking and feeling patients lacked motivation to stop smoking[18]. GPs often use ineffective strategies regarding smoking cessation and fail to identify smokers.

General practitioners are more likely to give smoking cessation advice when the patient presents with a smoking related problem[18].

Screening for smoking and counselling to stop smoking is cost effective and the benefits outweigh the harms. There is good evidence that advice from GPs to patients to stop smoking is effective. A Cochrane Review of 39 trials on the effect of doctors' advice to stop smoking showed a significant increase in the odds ratio of patients quitting for at least 6 months[19]. They found evidence that giving intensive advice had a small advantage over less intensive advice. However the US Clinical Practice Guidelines review showed incremental effect with increasing intensity advice[3]. Counselling lasting less than 3 minutes had an abstinence rate of 13.4% compared to counselling lasting more than 10 minutes with an abstinence rate of 22.1%. Increasing the number of treatment sessions improved abstinence rates.[3]. The United States Preventative Services Task Force (USPSTF) found good evidence that interventions to stop smoking like screening, motivational interviewing and medication are effective in reducing the number of smokers and those who remain off smoking after 1 year[3]. Importantly they found good evidence that stopping smoking lowers the risk of heart disease, stroke and lung disease. The risk of death from smoking falls soon after stopping[17]. The reduction of risk differs for the different diseases but is significant. For instance the risk of lung cancer drops to 50% after stopping smoking for 10 years[17].

GPs should use evidence based approaches when implementing smoking cessation strategies. There is evidence that using the 5 'As' strategy is effective in increasing quit rates amongst smokers. These 5 'As' are: 1. Ask and identify the smoker. 2. Advise all smokers to quit. 3. Assess willingness to quit. 4. Assist the patient to quit. 5. Arrange follow up contact[17]. The Smoking Cessation Guidelines for Australian general practice use the 5 'As' framework together with the stage of change assessment and motivational interviewing[20]. GPs can offer nicotine replacement therapy or bupropion after motivational interviewing to those who want it. A Cochrane review on nicotine replacement therapy showed that it can nearly double the number of patients who stop smoking compared to using no medication[21]. Thus nicotine replacement therapy increases the chance of stopping smoking and is most effective when combined with counselling[21]. There is evidence that bupropion is as effective as nicotine replacement therapy when given with intensive behavioural support[22]. About 19% of smokers who use bupropion to stop smoking achieve long term abstinence. The effectiveness of bupropion has only been tested with intensive behavioural support[22].

Recommendations: A review of the literature shows that as the burden of disease from smoking is high and smoking cessation advice effective screening for smoking is recommended. The recommended strategy is to screen all potential smokers and use evidence based approaches to counsel those who smoke. GPs should carry out a number of treatment sessions to improve abstinence rates and consider offering nicotine replacement therapy or bupropion.

b) Interview results: Strategies used by GPs in Grahamstown to screen for smoking

All the GPs interviewed screened for smoking but the strategies they use varies. There are three types of strategy they use:

1. those who only ask about smoking if the patient presents with a smoking related symptom or illness;
2. those who find out if the patient smokes at their first consultation as part of the history and
3. those who regularly ask their patients whether they are smoking or not on an ongoing basis.

One GP is passionate about smoking cessation and asks every patient at every visit. He states that when his patients "*see him in the street they throw away their cigarettes*"! Some of those GPs who use the first strategy felt they could pick up patients who smoke by stains on their fingers or the smell of cigarette smoke on the patient.

All the GPs advise their patients who smoke to stop. This usually takes a few minutes as part of the consultation and takes the form of education about the types of illness smoking can cause. Some try to frighten their patients by pointing out terrible consequences like *"needing an amputation"*. One GP said her advice to stop smoking is so strong that a patient commented *"I will tell all my friends who smoke not to see you!"* Although one GP tries to find out the patients' readiness to quit smoking none of the others used counselling strategies like motivational interviewing. Some of the GPs only offered advice if the patient had a smoking related illness. Only one of the GPs recommends nicotine replacement therapy but all recommend bupropion therapy if the patient can afford it. All the GPs said they had good results with bupropion therapy. Only one of the GPs followed up patients specifically about their smoking, two weeks after giving smoking cessation advice. The others said they would enquire about their patients' smoking habits when they presented again for another illness.

Six of the GPs interviewed felt giving smoking cessation advice was worthwhile, while the other five were pessimistic about how effective this advice could be. Those who were negative about the effectiveness of smoking cessation advice felt that smoking was an addiction and that generally patients lacked motivation to stop smoking. Some felt that the patient would give up if they wanted to and advice from the doctor would not make a difference. They felt that it was too time consuming to spend time on smoking cessation advice or counselling. Three of the GPs were very pessimistic, expressing that advice from the doctor is not effective and it is only given because the doctor felt *"morally obliged"* to do so and that *"whatever you do, you are doomed to failure"*. Those who are positive about the value and effectiveness of smoking cessation advice felt that many patients are motivated to stop smoking and succeed with help and advice from the doctor. One of the older GPs felt that motivation to stop smoking these days was far higher than *"it used to be in the old days"*. He thought the reason for this was *"there is much more media coverage these days"* and motivation is getting better *"due to increased public awareness"* of the harms of smoking.

Screening for breast cancer

a) Literature review: Recommendations on screening for breast cancer

The burden of breast cancer is significant and therefore it should be screened for. In North America it is the second leading cause of death from cancer. About 1 in 8 women are diagnosed with breast cancer at some stage in their life and 1 in 30 die from breast cancer[3]. The incidence of breast cancer increases with age. Most women do not have associated risk factors or genetic markers[3]. Breast cancer is also the second most common cancer in sub-Saharan Africa after cancer of the cervix. It appears to be less common compared to Western countries but occurs at a younger age with most patients presenting late with advanced disease. Lack of screening programs is one of the reasons for these late presentations[23].

Screening for breast cancer involves doing routine clinical breast examinations, teaching patients to do breast self-examinations and routine mammography. The USPSTF recommends women over the age of 40 should have a mammogram every 1 to 2 years. They recommend that women should be informed about the possible benefits and harms of mammography before deciding when to start screening. They state that there is insufficient evidence available at present to recommend for or against doing routine breast examinations or self-examinations by the patient to screen for breast cancer[3]. Research comparing clinical breast examination to screen for breast cancer compared to no screening is limited. Evidence is also lacking regarding the benefit of adding clinical breast examinations to mammography. Therefore it is impossible to determine whether the benefits outweigh the potential harms[3]. Breast self-examination does not reduce mortality from breast cancer and is potentially harmful because of the increased risk of false positive results and unnecessary biopsies[3]. A Canadian task force on preventative health care found that the harms of teaching breast self-examination out way the benefits and they recommend against teaching breast self-examination at routine annual health checks[24]. They suggest that only if a woman asks to be taught breast self-examination should she be shown

how to do it and that the benefits and harms must be clearly explained to her before hand. She should be shown how to do self-examination properly[24]. Mammography screening is more likely to benefit those women at greater risk of breast cancer like those with a family history of breast cancer; those with a first baby after 30 years of age or those with a previous abnormal biopsy of a breast lump[3]. The recommendation to start screening mammography at 40 years is strengthened by having had a relative with breast cancer before the onset of menopause. There is insufficient evidence to recommend screening for the gene mutations associated with an increased risk of breast cancer or whether screening should be done earlier for these patients[3].

The National Health Service (NHS) Breast Screening Program in England screens women from 50 to 70 years of age with mammography every 3 years because they feel there is sufficient evidence that this reduces mortality[25]. They screen about 1.3 million women each year and detect about 10 000 breast cancers per year. They have found that screened women are slightly more likely to be diagnosed with breast cancer than unscreened women and that the cancers are smaller and less likely to need mastectomy. They save one life from breast cancer death for every 400 women they screen over 10 years, thus saving 1400 lives a year in England[25].

A review in 1991 by Elixhauser into the cost effectiveness of screening for breast cancer found that mass screening by mammography improved early detection by 15 to 35%. The estimated cost of screening was between $13 200 and $28 000 per life year saved. The review found that screening was more cost-effective than not screening when all health care costs were taken into consideration but that the cost effectiveness of screening between the ages of 40 and 49 years was controversial[26]. Screening for breast cancer using mammography is expensive. Stout et al found that screening cost $166 billion dollars between 1990 and 2000, gaining 1.7 million quality adjusted life years at a cost of $62.5 billion compared to doing no screening[27]. In a recent analysis of cost effectiveness of breast cancer screening in India it was found that breast examinations done every year between the ages of 40 to 60 years were almost as effective at reducing mortality as doing mammography screening every 2 years at only half the cost[28]. Every year of life saved by the NHS Breast Screening Program in England costs about 3000 pounds[25].

Research results show a large variation in sensitivity and specificity of screening tests for breast cancer[3]. Sensitivity of mammography varies from 50 to 95%. Sensitivity is lower in younger women, those whose breasts are denser, and those on hormone replacement therapy. Specificity varies between 93 and 96% and is improved by screening more often and being able to compare previous mammograms. The sensitivity of clinical breast examinations varies from 40 to 70% and the specificity from 88 to 99% in different trials[3]. One large study found that only 4% of women with suspected cancer on breast examination turned out to have cancer. Sensitivity and specificity of self examinations are difficult to study and are therefore not known[3]. The potential harms of breast cancer screening are the anxiety, unnecessary biopsies, inconvenience, discomfort and cost associated with false-positive results[3]. The majority (80 to 90%) of abnormal mammograms or breast examinations turn out to be false positives. There is a possible risk of breast cancer being induced by the radiation of repeated mammography but this has not been adequately studied to determine what the risk is[3].

There is uncertainty about what age to start screening for breast cancer using mammography[3]. There is very good evidence that mammography every 1 to 2 years reduces mortality significantly. However most of these trials have been done on women older than 50 years. The evidence of a reduction in mortality in those aged 40 to 50 is weaker and the benefit is smaller than those older than 50 years because the incidence of breast cancer is much lower in those under 50 years. The benefits of mammography increase with age while the harms decrease. It is unclear at exactly what age the benefits outweigh the potential harms. The specific screening interval for women between 40 and 50 years is also unclear. Screening with mammography after the age of 70 has not been well researched. Older women are at increased risk of developing and dying from

breast cancer but are also at increased risk of dying of other causes. Screening after the age of 70 years is therefore not recommended[3].

The research into the effectiveness of mammography does not provide clear unequivocal evidence that it reduces mortality. A Cochrane Collaboration review[3] found that most of the trials were of a poor quality and that the pooled results of the only 2 good quality trials were not sufficient to prove that there is a benefit from mammography. The trials show a reduction in mortality ranging from 0 to 32%. Only one trial has looked specifically at the benefit of screening women between the ages of 40 and 49 years and they found mortality from breast cancer was not reduced using annual mammography and breast examinations[3].

Recommendations: Reviewing the literature shows that the burden of breast cancer is high indicating that screening is recommended. Annual breast examination and mammography every 3 years in women between the ages of 50 and 70 years is appropriate. Breast self-examination is not recommended unless patients request to be taught to do so and then harms and benefits must be explained to them.

b) Interview results: Strategies used by GPs in Grahamstown to screen for breast cancer

Three of the eleven GPs interviewed do not screen for breast carcinoma. They examine patients or refer for mammography if a patient complains of a lump. They refer well patients for mammography only when they ask to be referred. One of these GPs felt mammography *"doesn't pick up that much"*. One of these GPs does screen those with a family history of breast carcinoma by doing routine breast examinations. All of the other eight GPs recommend breast self-examination frequently: *"monthly"* or *"every time they are in the shower"*; and screen all women routinely by examining their breasts annually. Those who do routine annual checks include breast examinations from the age when the patient first starts attending for these at about the age of 20 to 30 years when they start coming for their PAP smears. These GPs who screen for breast cancer use a wide range of strategies when it comes to mammography for patients who are not at high risk. One of them does not refer for routine mammography at all believing that an *"experienced doctor is as accurate as a mammogram"* in detecting early breast cancer. The others all refer patients for routine mammograms but vary from which age they recommend a patient should start. The youngest recommended age to start routine mammogram screening amongst the GPs is 30 years and the oldest 50 years. The frequency that the GPs recommend repeat mammograms for screening also varies. Three of the GPs recommend annual mammograms while the others recommend repeating every 2 or 3 years. All the GPs stated they screen their high risk patients more intensely than those not at high risk.

None of the GPs interviewed keep a register or send reminders to patients to attend for breast cancer screening. Those that screen annually rely on the patient to return for their annual check up. None of the GPs involve their patients in decisions about screening by discussing the potential benefits, limitations and possible harms before hand. They all recommend the screening, stressing the potential benefit of excluding breast cancer or diagnosing it early. Most will discuss the possibility of a detected lump not being cancerous (false positive results) once the screening has detected it. All the GPs who screen for breast carcinoma said their patients accepted the breast examinations and mammograms. One did indicate that his patients who know him socially prefer to go to a colleague for breast examinations. One of the GPs who does not screen feels that women do not find it acceptable for him to do routine breast examinations. All the GPs noted that their more disadvantaged patients are screened at a much lower rate than their more advantaged patients, if at all. Various reasons were given for this including that the patients are less informed and do not demand screening, attend the GP for mainly curative problems and not being able to afford mammograms.

Screening for cervical cancer

a) Literature review: Recommendations on screening for cervical cancer

Secondary prevention of carcinoma of the cervix involves doing cytology smears (Papanicolaou or PAP smears) as part of screening in general practice. Although PAP smears are used mainly to diagnose cancer of the cervix and detect precancerous lesions they also can provide information about gynaecological infections and can be used to monitor treatment[29].

Screening for cervical carcinoma can be justified because it is a common and serious public health problem. Cervical cancer is the most common cancer causing death in sub-Saharan Africa[30]. In 2002 about 500 000 new cases of cancer of the cervix were diagnosed with approximately 274 000 deaths world wide. Approximately 83% of these were in developing countries where carcinoma of the cervix makes up about 15% of all cancers, compared to 3.6% in developed countries[30]. The Cancer Registry of South Africa documented 5203 new cases of cancer of the cervix in 1999. This was 17% of all cancers in women. 84% of patients were black with an estimated 1 in 21 black women being at risk of cervical cancer[30]. The marked difference of cervical cancer rates in developed countries is attributed to mass cervical cancer screening programs.

Estimates of sensitivity and specificity of PAP smears to detect squamous carcinoma of the cervix vary greatly[31]. Estimates for sensitivity range from 11% to 99% and specificity 14 to 97%. It is not possible to get high specificity and sensitivity at the same time using PAP smears to diagnosis carcinoma of the cervix. Specificity in the range of 90-95% corresponds to sensitivity of 25-30% [31]. Thus PAP smears are more useful to rule in disease than rule out disease.

Recommendations for when to screen vary greatly probably because evidence is limited. The United States Preventative Services Task Force (USPSTF) suggests most of the benefit can be obtained by beginning screening within 3 years of onset of sexual activity or age 21 (whichever comes first) and screening at least every 3 years[3]. They found limited evidence that screening in women older than 65 who had had normal pap smears was worthwhile. They recommend annual testing in symptomatic women and those at high risk like those with HIV and/or HPV infections and those who have many sexual partners[3]. Recommendations or guidelines for cervical cancer screening in South Africa are lacking but it has been shown that more than 80% of cervical cancers and related deaths can be prevented by organized regular population based PAP smear screening that is provided at intervals of 3 to 5 years[29]. The high prevalence of human immunodeficiency virus (HIV) and human papilloma virus (HPV) infections in South Africa and the association of cervical carcinoma with these infections increase the burden of this disease, making screening even more important.

The screening procedure is uncomfortable and therefore patients may have reservations about having them. A large number of women avoid or delay having pap smears. The treatment of dysplasia is acceptable, affordable, safe and effective for most patients. Further investigations and the treatment of detected premalignant lesions form an essential part of screening. Approximately 99% of cervical cancers can be prevented by treatment of premalignant lesions[29]. Cervical carcinoma has a prolonged pre-symptomatic phase with progression from pre-invasive condition to invasion taking as long as 10-20 years[29]. Treatment can dramatically change the course of the disease and only treating the disease in the symptomatic phase results in high morbidity and mortality. The United States Preventative Services Task Force (USPSTF) strongly recommends screening for cervical cancer in women who have been sexually active and have a cervix. They found good evidence that screening with cervical cytology reduces incidence of and mortality from cervical cancer and conclude that the benefits of screening substantially outweigh potential harms[3].

Research indicates that GP and patient reminders are recommended to encourage women to have regular PAP smears[31].Thus a register of patients who require pap smears is advisable[32].

There appears to be controversy over including HPV testing in screening for cervical cancer. The American Cancer Society and American College of Obstetricians and Gynaecologists recommend combined HPV and Pap smear testing to screen for cervical cancer[33]. However there is no evidence to support the use of HPV DNA testing as a primary screening tool for cervical cancer or for testing women with equivocal Pap smear results[34]. A Cochrane review of 40 studies found that using a combination of a cytobrush and an extended tip spatula is the most effective technique for collecting PAP smears. This combination achieved better rates of detecting endocervical cells than the commonly used Ayre spatula[35]. Although liquid based cytology has become popular for cervical carcinoma screening it is still unclear whether this is better than smear technology. A review and meta-analysis of studies between 1991 and 2007 found that liquid based cytology was neither more sensitive nor specific than Pap smear in detecting high grade cervical intra-epithelial neoplasia[36]. The USPSTF states that at present there is insufficient evidence to recommend for or against new technologies or routine testing for HPV to screen for cancer of the cervix[3].

In a review of cervical cancer screening in the developing world Cronje notes that cervical cancer is still the most common cancer in low income countries because of the inadequacies of screening. Important factors contributing to this are the relatively high costs; low sensitivity; need for expertise and the logistics of mass PAP smear screening. However he does go on to point out that there is not a more advantageous screening method[37]. In a review of cervical cancer screening methods in less developed countries Mandelblatt et al compared the costs and benefits of the different strategies used. They found that all strategies saved lives, reducing mortality by up to 58%. Visual inspection of the cervix after applying acetic acid (VIA) was the least expensive at 517 US dollars per life year saved compared to a combination of PAP smear and HPV testing which cost 1683 US dollars per life year saved. VIA achieved 83% reduction in mortality whereas combination of PAP and HPV testing could achieve greater than 90%. They found PAP smear was a cost effective alternative costing less than 1000 US dollars per life year saved if sensitivity is above 80%. They recommended that less developed countries can reduce mortality at low cost by having a well organised screening program. Optimal policies need to be made appropriate for the given setting[38].

Recommendations: Cervical cancer is common and the morbidity and mortality is greatly reduced by screening. PAP smears should be started from within 3 years of the onset of sexual activity or age 21 and repeated every 3 to 5 years in women who are not at increased risk. Those at increased risk should have PAP smears annually. It is not necessary to continue doing PAP smears after the age of 65 years if the patient has had normal smears throughout life. Patient registers and reminders are recommended to improve screening rates.

b) Interview results: Strategies used by GPs in Grahamstown to screen for cervical cancer

All the GPs interviewed screen for cervical carcinoma with PAP smears. They start screening when the patients become sexually active or at the age of about 18 to 20 years. One of the GPs pointed out that it is sometimes difficult to get the screening started because one is not always sure if the young women are sexually active or how they will respond to the recommendation. She stated that, *"it is not so easy when you see young people to start with PAP smears"*. Three of the GPs said they screen in a targeted way by recommending PAP smears only when women present with gynaecological symptoms. All the others recommend routine regular PAP smears. Six of the GPs recommend repeating normal PAP smears annually on all women whether at increased risk of cervical cancer or not. One GP recommends them every 2 years and the other every 3 years. All the GPs screen throughout life except for one who stops screening at age 60 years if the woman's PAP smears have been normal. One commented that *"while they have a cervix they*

need a PAP smear". One of the GPs does a vaginal examination annually at the time of Pap smear feeling that *"checking for ovarian cancer is more important in the type of patient we see".*

None of the GPs spend time discussing the potential benefits and harms of screening before doing PAP smears. All the GPs do the PAP smears themselves and all but one, who uses the Ayres spatula, uses the cytobrush. None of the GPs use liquid based technology or blood tests for HPV to screen for cervical carcinoma. None of the GPs keep a register of patients needing PAP smears or send patient reminders. They all rely on the patient to remember to return for repeat PAP smears. One of the GPs who recommend annual PAP smears commented that when he checks on when his patients had their last smear often a few years have gone by.

One of the GPs who do not do PAP smears routinely on healthy women does them annually on HIV positive women. The GPs who screen regularly do not identify those at high risk but instead screen everybody intensively. Some of them commented on how difficult it is to know if patients had multiple partners and were therefore at increased risk of cervical cancer. One commented, *"Nobody is going to tell you they have multiple partners".* One GP presumes all the young women have multiple partners and screens them annually and once they marry or settle down with one partner starts to extend the interval he recommends between PAP smears. All the GPs commented that although their patients were sometimes reluctant to do PAP smears and delayed doing them, they generally find the procedure acceptable and get them done.

Screening for colorectal cancer

a) Literature review: Recommendations on screening for colorectal cancer

There are several options to screen for colorectal cancer. These are faecal occult blood testing, flexible sigmoidoscopy, colonoscopy, barium enema, computed tomography, virtual colonoscopy and stool DNA extraction. This is secondary prevention to detect colon cancer early and thereby reduce mortality from this condition. Faecal occult blood testing can take place as a side-room investigation or as a specimen sent to the laboratory for testing. A detailed family history forms part of screening to identify those at increased risk of colorectal cancer. Those with familial adenomatous polyposis and hereditary non-polyposis colon cancer need to be referred early to specialists for more intensive screening and follow up.

Colorectal cancer poses a significant public health problem. Worldwide approximately 850 000 people are diagnosed with colorectal cancer each year and 500 000 die from it anually[39]. It is the second leading cause of death from cancer in the United States. A 50 year old has a 5% chance of getting colorectal cancer and death from it costs on average 13 years of life[39]. About 20% of colorectal cancers are familial with 70% occurring on a sporadic or non-hereditary basis[39]. The rate of colorectal cancer has been lower in black than white patients in South Africa but, possibly due to changes in diet, the occurrence in the urban African population is rising[40]. Rates of colorectal cancer are higher among blacks in westernised countries. For instance the rates in African Americans are slightly higher than for whites[41]. This makes screening in South Africa more important than it has been in the past.

There is a pre-symptomatic phase of the disease when the pre-cancerous lesion is a polyp which is difficult to differentiate from cancer. Once this has become malignant there is a short lead time before the prognosis begins to deteriorate. Therefore it has to be picked up early to improve outcome making it necessary to test frequently. Thus faecal occult blood testing has to be done annually to be worthwhile. The USPSTF recommends screening men and women over 50 years for colorectal cancer as they found evidence this reduces mortality[3]. All methods of screening mentioned above have evidence they reduce mortality except for computed tomography[3]. In a review of colorectal cancer screening methods including occult blood tests, sigmoidoscopy, colonoscopy, double-contrast barium enema, virtual colonoscopy and faecal DNA, Walsh et

al found there was good evidence that screening for colorectal carcinoma was worthwhile and reduced mortality but there was not evidence that one test was better than any of the others[42]. Faecal occult blood testing is obviously the cheapest and least invasive of these. They recommend screening should include an annual faecal occult blood test, flexible sigmoidoscopy every 5 years and colonoscopy every 10 years for the average risk population. The best evidence for colorectal cancer screening is for the use of faecal occult blood testing and flexible sigmoidoscopy[43]. Routine colonoscopy has not been shown to improve mortality but has the most accuracy as a single test. Therefore colonoscopy should be used as the last test in the investigation and treatment of patients with other abnormal tests. Double contrast barium enema, CT colonography and faecal DNA testing need further evidence before they can be recommended for routine screening[43]. There is evidence that screening should continue until age 75 years[43].

There are patients with increased risk factors like those with a family history of colorectal cancer, familial polyposis and ulcerative colitis who require more intensive screening. It has been recommended that those patients who have had a first degree relative with colon cancer start annual screening earlier at age 40 and those whose family member had cancer before age 50 start screening at an age 10 years earlier than the age the family member developed the cancer[39].

Generally screening rates for colorectal cancers are poor, particularly in lower-socioeconomic communities. Wolf et al found that only 7% of people in low socio-economic areas of Chicago were appropriately screened by physicians at Federal Health Centres. Among those who did receive a recommendation from their physician 76.2% had completed a screening test (primarily faecal occult blood test-94.1%). They concluded that organizational interventions needed to be made to promote screening recommendations in medically underserved areas[44]. Even in medically well served areas screening rates are poor because of physician failure to recommend screening and poor patient adherence. Ling et al showed enhanced practice and patient management with a register and recall system improving colorectal cancer screening adherence significantly[45]. Most patients find faecal occult blood testing acceptable and are willing to undergo the test but find the invasive procedures less acceptable because of discomfort, the preparation required and risk of complications[3]. A multi-centre study in Australia found that participation in screening was significantly higher in those using faecal occult blood testing than the other more invasive methods[46]. Some patients might not like the idea of producing stool specimens but if an explanation is given to them regarding the rationale behind the testing most find it acceptable. It is feasible and widely available in most areas[47]. Many patients may not be prepared to undergo the more invasive tests for screening purposes.

Annual faecal occult blood testing reduces mortality by more than 20%. It also results in the reduction of the incidence of colorectal cancer by up to 20% by detecting large adenomas which can be removed[48]. The prognosis of colorectal cancer mainly depends on the stage at diagnosis. Cancers detected at an earlier stage having a better prognosis[49]. It is logical that patients would prefer earlier detection and therefore earlier treatment as this improves the morbidity and mortality associated with the disease and its treatment.

Side room faecal occult blood testing is less sensitive and specific than laboratory testing. The reason for this is it is only one test and is done on a specimen from rectal examination which may be inadequate or contain blood from trauma caused by the examination. Some studies show laboratory faecal occult blood testing has a sensitivity of 40 – 60 % and specificity of 90 – 98 %[45]. The advantage of faecal occult blood testing is the ability to detect most early colorectal cancers and significantly reduce mortality[45]. Some studies report a lower specificity meaning many false positive screens[47].The disadvantages being that it misses half the cancers and many unnecessary colonoscopies are done on those without cancer. DNA markers in the stool are highly sensitive and much more specific than faecal occult blood tests but have not been adequately researched to be recommended for routine screening and are still extremely expensive[48]. Although the other tests are more sensitive and specific than faecal occult blood tests, they are invasive and therefore if used for screening also result in a large number of unnecessary procedures. For instance screening with

sigmoidoscopy detects 8 cancers for every 1000 examinations and colonoscopy results in many patients having polyps detected or removed but only a small percentage would have developed cancer[50]. The invasive procedures have the potential harms of sedation/anaesthesia and complications from the procedures, although these are rare. Thus faecal occult blood testing is the best method available to screen asymptomatic people at average risk who would then need colonoscopy if positve[46]. Virtual colonoscopy has a high sensitivity in detecting colorectal cancers although this varies from centre to centre as experience of using the technology grows. It can therefore be used to investigate patients who are faecal occult blood positive to screen out those who do not have cancer. If no cancer is detected it enables the patient to avoid colonoscopy which could be reserved for those needing therapeutic intervention[48].

Faecal occult blood testing is cheap and extremely cost-effective[46]. A pilot study of over 250 000 people in the United Kingdom detected colorectal cancer in 0.16% with faecal occult blood testing and therefore concluded routine testing would lead to a decrease in mortality from the disease[49]. A more recent study looking at the value of offering screening found that if 4 million people were offered screening as recommended about 31 500 deaths would be prevented and 338 000 years of life would be gained. They conclude that colorectal cancer screening is "*a high-impact and cost-effective service*"[50]. Frazier et al compared several strategies recommended by an expert panel for screening for colorectal cancer in average risk people. They found the most cost effective strategy is annual faecal occult blood testing plus sigmoidoscopy every 5 years (followed by colonoscopy if a low or high risk polyp is found) from 50 to 85 years[46]. This results in a 60% reduction in cancer incidence and 80% reduction in cancer mortality compared with no screening[51]. All other recommended strategies were either less effective or significantly less cost effective[52].

Recommendations: The burden of colorectal cancer is significant and increasing in the black population. Screening has been shown to significantly reduce mortality. Research shows that a cost-effective screening strategy is faecal occult blood testing annually, sigmoidoscopy every 5 years and colonoscopy every 10 years between the ages of 50 and 75 years for those at average risk. High risk patients should be screened more intensively.

b) Interview results: Strategies used by GPs in Grahamstown to screen for colorectal cancer

Only one of the GPs interviewed screens for colorectal cancer. The reasons given by the GPs for not screening were varied. Some felt that patients would find the screening process unacceptable because they would find producing stool specimens embarrassing and colonoscopy uncomfortable. The other main reason given for not screening was that the GPs felt *"unsure about the evidence for colorectal screening"* or being *"unsure about the pick up rate"* of stool occult blood testing. The one GP who screens does stool occult blood testing on all patients older than 55 years of age. He refers patients for sigmoidoscopy or colonoscopy if the stool occult blood is positive. He does not refer for sigmoidoscopy or colonoscopy routinely at any stage. He commented *"what is frustrating is how many positives (stool occult blood tests) I get and send them to a colorectal specialist and they don't find anything"*.

All the GPs investigate patients for colorectal cancer when they have symptoms that could be caused by the disease, like altered bowel habit or abdominal pain. They all consider high risk patients to be those whose relatives had colorectal cancer and refer them to specialists for screening and follow up.

Screening for hyperlipidaemia

a) Literature review: Recommendations on screening for hyperlipidaemia

Screening for and treating hyperlipidemia is secondary prevention to prevent cardiovascular disease, particularly coronary artery disease. Screening involves history, examination and blood testing. Important risk factors on history are diabetes, family history of cardiovascular disease at a young age and/or hyperlipidemia and other risk factors for coronary heart disease like smoking and hypertension[53]. Examination for xanthelasma, arcus cornealis and xanthomata are important to detect possible hyperlipidemia[54]. Initial screening involves testing non-fasting cholesterol and high density lipoprotein-cholesterol (HDL). If these are elevated a fasting lipogram including triglyceride level is done[55]. Overall risk factors for heart disease like age, sex, diabetes, hypertension, family history and smoking must be considered when deciding on treatment, rather than only considering the lipid levels. Treatment involves diet initially and drug therapy for those who do not achieve therapeutic goals, especially those at high risk. All modifiable risk factors should be addressed simultaneously[53].

The USPSTF recommends screening all men 35 years and older and women 45 years and older for hyperlipidaemia and offering treatment to those who are at increased risk of coronary heart disease, because there is good evidence that measuring lipid levels can identify asymptomatic people at increased risk of coronary heart disease and that lipid-lowering drug therapy decreases the incidence of coronary heart disease in such people. They feel the benefits definitely outweigh the harms[3]. They also feel younger adults (men 20 to 35 and women 20 to 45) should be screened if they have other risk factors for coronary heart disease. The optimal time interval between screenings is uncertain but it is reasonable to test every 5 years. Those at high risk or needing treatment should be tested more frequently. Repeated screening in people over 65 who have previously had normal tests is not recommended because lipid levels are less likely to increase after 65 years[3].

Coronary artery disease is the leading cause of morbidity and mortality worldwide[53]. Dyslipidaemia and coronary heart disease have reached epidemic proportions in whites, coloureds and Indians and is rapidly increasing in blacks in South Africa[56]. Evidence suggests that dyslipidaemia is not just a risk factor for coronary heart disease but a cause. It has been noticed in South Africa that patients with familial hypercholesterolemia, dyslipidaemia alone, without other risk factors, can cause severe and premature coronary heart disease and that in blacks without dyslipidaemia coronary heart disease is rare despite the high prevalence of hypertension, smoking and diabetes[56]. Thus hyperlipidaemia is a serious health problem warranting preventative measures. There is a pre-symptomatic phase of the disease when hyperlipidaemia can be detected and treated before coronary artery disease occurs. There is evidence that lipid lowering interventions with lifestyle changes or drug therapy reduce the rates of cardiovascular events[53].

There is adequate participation of the target population in screening but many do not find the treatment acceptable. Many find it difficult to change their lifestyle and diet. The minority of patients achieve significant lipid lowering with diet alone and most need drug therapy[3]. The statins are the first choice drug therapy and are very effective. Six major trials involving over 30 000 patients have shown a decrease in coronary artery disease morbidity and mortality, stroke and peripheral vascular disease[53]. Cost is a limiting factor for those who are not on a medical aid which will pay for them, but recently prices have come down significantly in South Africa. They are cost effective in terms of the cost of disease morbidity they prevent. The statins are safe drugs with the ratio of lives saved to those lost being 100 000 to 1, therefore justifying lifelong clinical use in those who need it[53]. Hepatotoxicity (0.5%) and myopathy (<0.5%) are the 2 main side-effects which may limit their use. Normal values for hyperlipidaemia are well established making sensitivity and specificity high but care has to taken when and how blood specimens are taken and handled[55].

Recommendations: South Africa has a high rate of dyslipidaemia and coronary artery disease making screening worthwhile. Prevention strategies should include history and examination. Research shows that testing for hyperlipidaemia should be started at age 35 years for men and 45 years for women and repeated every 5 years until the age of 65 years if normal . Patients at high risk or with abnormal results should start screening earlier and test more frequently.

b) Interview results: Strategies used by GPs in Grahamstown to screen for hyperlipidaemia

All the GPs interviewed screen for hyperlipidaemia. One GP commented that screening for cholesterol is a *"current favourite, everybody asks for it"* and that he is *"screening masses"*. Five of the GPs only screen patients with other risk factors for ischemic heart disease or those who request cholesterol testing. The others routinely recommend screening to all their patients. Most GPs screen with a fasting lipogram, while 3 of the GPs prefer to do random total cholesterol as the initial screening test and only do the fasting lipogram if this is elevated. One GP stated he preferred this approach because, *"I'm more likely to capture the patient if I do non-fasting"*. None of the GPs use finger prick testing for cholesterol, one stating that finger prick cholesterol is *"notoriously inaccurate"*.

The GPs start screening for hyperlipidaemia at ages varying from 30 to 50 years. None of the GPs have a cut off age when they no longer screen. All start screening those at higher risk younger than those without risk. All the GPs screen the high risk patients annually and six of them screen both high and low risk patients annually. Those who screen even the low risk patients annually do so as part of the annual health check. They seem to do this because it is convenient and easier to remember annually as part of a routine health check. One GP felt that as the test is inexpensive an annual check is useful as a reminder to the patient about their health and if the result is normal it encourages them to stay healthy. He stated that *"the fact that he is doing something positive towards his health, that kind of good news does so much good …it's a reminder … rather than waiting for things to happen to you, you are making things happen"*. One GP recommends repeat screening every 3 years for those without risk factors while the others leave the timing of repeat testing up to the patient.

None of the GPs keep a register or have a recall system for hyperlipidaemia screening. All of the GPs recommend lifestyle change in the form of diet and exercise before resorting to drug therapy. Some said many of their patients were reluctant to take medication for hyperlipidaemia but all the GPs said that those that were put on medication generally tolerated it well. All the GPs discuss the advantages of and reasons for screening for hyperlipidaemia but not the disadvantages. All the GPs interviewed were pessimistic about their patients' ability to change to healthy lifestyles. They noted that very few succeeded in making a sustainable change. One commented that diet and exercise seems to be *"one of the most difficult changes to make"*. Another felt that *"eating habits are like an addiction which patients find difficult to change"*. All the GPs acknowledged that their more disadvantaged patients are screened at a much lower rate and some said not at all. One commented that they do not demand screening because *"they may not have access to information"*.

Screening for prostate cancer

a) Literature review: Recommendations on screening for prostate cancer

Prostate cancer is common. About 1 in 6 men in the United States are diagnosed with it in their life time. In 2007 about 200 000 men in the United States were diagnosed with cancer of the prostate and approximately 270 000 died of the disease in 2006[3]. The average age of death from prostate cancer was 80 years with most men (71%) dying after the age of 75 years. Many cases of prostate cancer detected by screening would never cause symptoms during the patient's lifetime. Studies show that prostate-specific antigen (PSA) screening over diagnoses prostate cancer by up to 40% causing a significant burden on this group of the population[3]. In sub-Saharan Africa prostate cancer is estimated to constitute about 10% of all cancers in men. The highest incidence occurs in Southern Africa at 40 per 100 000 males. In South Africa the incidence is 40 per 100 000 white males and 14 per 100 000 black males[57]. However screening and diagnostic tests are less available to the black population. In America black males have the highest incidence of prostate cancer in the world, 72% higher than white Americans[57]. Histologically proven cancer of the prostate increased four fold between 1986 and 1995 in South Africa probably because of improved screening methods like the use of the prostate-specific antigen (PSA) test[57].

The prostate specific antigen (PSA) test is more sensitive in detecting prostate cancer than digital rectal examination[3]. However the PSA test cannot achieve both high sensitivity and specificity. Although the cut off point of 4ng/ml is widely used to indicate possible prostate cancer it is an arbitrary level without high sensitivity or specificity. No PSA level offers both high specificity and sensitivity. Lower cut off levels will detect more cancers but obviously result in many more false positive tests[3]. PSA tests improve early detection and help predict the risk of complications and monitoring treatment but there is no evidence they lower mortality of prostate cancer[3]. Using additional markers known as kallikrein markers may improve specificity and reduce cost by reducing the number of unnecessary biopsies[58]. An approach that has been suggested is to do a PSA in early middle age which can predict risk of prostate cancer later in life and indicate the intensity of screening that is appropriate for each individual[58]. Other methods of screening like PSA levels adjusted for age, free PSA and monitoring PSA increase (PSA velocity, slope or doubling) have not been shown to improve the outcome of prostate cancer[3]. The detection rate of prostate cancer by biopsy varies depending on how many biopsies are taken. Therefore it is difficult to assess the accuracy of screening tests. The specificity of a high PSA level appears to increase when more biopsies are done, but these result in more clinically unimportant cancers being detected. Thus the accuracy of the PSA in detecting clinically important cancer of the prostate is difficult to determine[3]. A retrospective study found that a PSA level above 4 ng/ml had a sensitivity of 91% for detecting aggressive prostate cancer but only 56% for detecting non-aggressive cancer. The same study showed a PSA cut-off of 4 ng/ml had a specificity of 91% for prostate cancer[3]. In a multicentred clinical trial of over 6000 men PSA was shown to detect more cancers, 82% than digital rectal examination (DRE), 55%. The cancer detection rate was 4.2% for PSA, 3.2% for digital rectal examination and 5.8% for the 2 screening tests combined. They concluded that optimal screening for prostate cancer is achieved by combining digital rectal examination with PSA tests and that a biopsy should be considered if the PSA is above 4ng/ml or the DRE is suspicious[59]. Carvalhal et al screened over 22 000 men and showed that digital rectal examination detects a significant number of potentially curable prostate cancers in patients with a PSA of 4 ng/ml or less[60].

PSA screening has been used for 20 years, increasing the detection of prostate cancer while it is still curable and thereby decreasing mortality. This has resulted in screening programs recommending PSA testing from as early as 40 years of age. The PSA is the best studied marker for detecting cancer of the prostate. However there is no good evidence from randomised controlled trials which show that this reduction in mortality outweighs the harms like the cost and morbidity associated with over diagnosis and treatment[61]. The USPSTF does not find sufficient evidence to show that the benefits of screening for prostate screening

outweigh the harms in men less than 75 years of age. While there is good evidence that the PSA can detect some cases of prostate cancer there is not clear evidence that patients detected by screening have a better outcome than those detected clinically when experiencing symptoms[3]. They also found that in men older than 75 years the outcome of prostate cancer detected by screening compared to unscreened patients was negligible. Screening and treating prostate cancer detected by screening can result in harms which in many patients may not have occurred because the cancer may not have caused symptoms in their lifetime. These harms are anxiety associated with false positive results, pain and discomfort of unnecessary biopsies, erectile dysfunction, urinary incontinence and even death associated with treatment[3]. Thus in their recommendations the USPSTF conclude that there is insufficient evidence currently to recommend for or against screening for prostate cancer in men younger than 75 years and that they recommend against screening in men older than 75 years. This is in keeping with a Cochrane review of the evidence for screening prostate cancer. They found there was not enough high quality research to determine whether screening improved mortality compared to no screening. They also found no randomised controlled trials on the harms and cost effectiveness of screening or the effects on patients' quality of life[62].

The number of cancer cases detected decreases dramatically with repeated screening tests. If screening were shown to improve mortality screening every 4 years would be as beneficial as screening every year[3]. It is uncertain what the best treatment of possible prostate cancer detected by screening is[3]. Possible treatment options include observation with symptomatic treatment; actively monitoring biochemical markers and treating when the disease progresses; prostatectomy or radiation. It has been shown in men over 65 years at the time of prostate cancer diagnosis the mortality from the cancer at 10 years is the same between the group who were watched and those who had prostatectomy, which suggested there was no benefit from surgery in this age group[3].

Patients should be informed of the uncertainties regarding the benefits and the known harms of screening for cancer of the prostate so they can make an informed choice about whether to do PSA tests. If screening were shown to improve the outcome of prostate cancer, men between 50 and 75 years old would be likely to benefit the most[3]. It would take 10 years for men to experience a benefit in mortality, thus very few men over 75 years would experience this mortality benefit. Also men younger than 75 years with chronic medical illness and a life expectancy less than 10 years are unlikely to benefit from screening and treatment[3]. In the United States most medical organisations recommend that screening strategies for prostate cancer should be chosen specifically for each individual after discussing the benefits and harms with them and finding out their preferences. They feel that it is appropriate to screen men over the age of 50 who have a life expectancy over 10 years and recommend offering PSA and digital rectal examination annually[3]

Recommendations: Cancer of the prostate is common in South Africa and therefore screening is appropriate. However it is important for GPs to be aware of the uncertainty regarding whether the benefits of screening outweigh the harms and explain this to their patients. If patients choose to screen for prostate cancer a PSA test and digital rectal examination every 4 years between the age of 50 and 75 years is appropriate. Screening men with chronic medical illnesses and a life expectancy of less than 10 years is not recommended.

b) Interview results: Strategies used by GPs in Grahamstown to screen for prostate cancer

All the GPs apart from two routinely screen for prostate cancer. The two who do not routinely screen investigate for prostate cancer when there are lower urinary tract symptoms. One of these GPs feels there is *"not much benefit"* to screening for prostate cancer. The nine GPs who screen for prostate cancer recommend the PSA test and three of these also do a routine digital rectal examination (DRE). The three female GPs say the male patients do not like them doing rectal examinations. One of the male GPs noted that *"many people refuse to have it done anymore".* Those who do not recommend DRE feel it is no longer necessary because the PSA is more accurate and one stated that she *"is not particularly good at doing DRE".*

All those who screen do so annually apart from one GP who recommends repeat tests every 2 to 3 years. The ages the GPs recommend starting screening range from 40 to 55 years and they all screen throughout life. Some of the GPs said they screen throughout life because the patients have a right to know whether they have cancer or not and that it is difficult to explain to a patient that one is no longer screening because they are at an age when they are more likely to die of some other condition. One GP also said he continued testing into old age to avoid litigation if a cancer was missed.

None of the GPs keep a check list or register of patients needing tests and leave it up to their patients to return for repeat tests. Only one of the GPs interviewed involves his patients in decisions about screening by discussing the benefits and harms before testing. He says that despite pointing out the possible harms of false positive tests like anxiety and unnecessary biopsies his patients still want the tests done. All the other GPs discuss the benefits of diagnosing cancer of the prostate early but do not discuss potential harms of screening. Some say that patients are accepting of false positive results resulting in a negative biopsy and are grateful and relieved to be cleared of having cancer. One of the GPs who dose DRE noted that patients “don’t like it but get it done”. All the GPs agreed that their more disadvantaged patients get screened at a lower rate.

Screening for human immunodeficiency virus (HIV) infection

a) Literature review: Recommendations on screening for human immunodeficiency virus (HIV) infection

Statistics published by the WHO in July 2008 estimated that worldwide 33 million people were living with HIV by the end of 2007. The South African Department of Health Study of 33 488 pregnant women attending antenatal clinics across the country found that about 28% of pregnant women were HIV positive in 2007[63]. The South African National HIV Survey in 2005 estimated that about 10.8% of South Africans were living with HIV. (Africans 13.3%, Whites 0.6%, Coloureds 1.9%, Indians 1.6%). The prevalence among 15 to 49 year olds was estimated to be 16.2%. Using both studies and other data UNAIDS/WHO estimated the prevalence among 15 to 49 year olds to be 18.1% at the end of 2007[63]. At the end of 2007 it was estimated that 22 million adults and children were living with HIV in sub-Saharan Africa with about 1.5 million dying from AIDS. South Africa was estimated to have 5.7 million people living with HIV with about 350 000 deaths from AIDS in 2007[63]. With almost 1 in 5 adults being infected in South Africa and given that almost half of all deaths in South Africa are caused by AIDS, HIV screening has become extremely important. The AIDS epidemic has not only caused a great deal of suffering and many deaths but also impacted significantly on social and economic progress in South Africa. The life expectancy has now dropped to 54 years[63]. The prevalence of HIV is stabilizing or even dropping slightly. Among teenage girls, the prevalence dropped from 16.1% in 2004 to 12.9% in 2007. This may be due to younger women practicing safer sex. However the prevalence has increased among older women over the same period[63].

The USPSTF recommends screening all adolescents and adults at increased risk for HIV[3]. Patients should be considered at increased risk if they live in an area of high prevalence or have any of the following risk factors: men who have sex with men; those who have unprotected sex with multiple partners; intravenous drug users; sex workers; partners of HIV positive people and patients treated with other sexually transmitted infections[3]. Patients who request an HIV test may have high risk behaviour they are unwilling to disclose and therefore should also be screened. Screening strategies should be tailored to the prevalence of HIV in the population being served with routine screening recommended for populations with high prevalence (>1%)[3]. While it is possible to identify a large proportion of those patients at risk many are missed who do not report risk factors because they are reluctant to disclose high risk behaviours or do not know their partner has put them at risk. In 2006 the United States Centre for Disease Control recommended routine voluntary testing of all patients between the ages of 13 and 64 years attending health facilities. It was realised that only screening those with risk factors was inadequate as they estimated that as many as 25% of those infected with HIV were unaware of being infected[64].

Research has shown that screening populations with an HIV prevalence of 1% is cost effective in that the cost per quality adjusted life year is acceptable[65]. Screening for HIV (approximately $50 000 per quality adjusted life year (QALY) gained) is more cost effective than recommended screening for many other diseases like breast cancer ($57 500 per QALY gained); colon cancer ($57 700 per QALY gained) and type 2 diabetes ($70 000 per QALY gained) [65]. HIV screening is even more cost effective when one takes into account the added benefit of reducing transmission that may result from testing. Translating this to a high prevalence country like South Africa with a prevalence of over 10%, HIV testing is definitely cost effective.

All standard HIV tests, including rapid tests, have a high sensitivity and specificity of over 99%[65]. False negative and false positive results do occur but are very rare. The accuracy of tests is the same for pregnant women and non-pregnant women and men. The enzyme-linked immunosorbent assay (ELISA) and Western blot test detect anti-bodies to HIV1 and 2 and are the most commonly used tests to diagnose HIV[66]. The WHO recommends using two separate ELISA or rapid tests to confirm HIV infection in areas where the prevalence of HIV is over 10%. They recommend three tests in areas of lower prevalence[67]. Because the

ELISA tests have become so accurate a Western blot test is no longer needed for confirmation of HIV infection. The Western blot assay for HIV-2 is the most accurate test to confirm HIV-2 infection[67]. The third generation HIV ELISA tests detect HIV from an early stage reducing the window period to 4 weeks[67]. Rapid HIV tests are now extremely accurate and because they are simple and do not require expensive laboratory equipment are very cost-effective. The WHO now allows for 2 or 3 different rapid HIV tests to be used to confirm a diagnosis of HIV infection. This gives results with similar high sensitivity and specificity as ELISA tests[68]. Thus rapid HIV tests are likely to be used more and more for screening. HIV ELISA and rapid tests on saliva and urine are currently used for surveillance but not diagnosis as they are not as accurate as blood tests. Polymerase chain reaction (PCR) tests detect HIV DNA with very high sensitivity and specificity from 2 weeks after infection. However they are technically difficult and costly to perform and are therefore not usually used for screening. PCR tests are useful for very early diagnosis; to verify indeterminate ELISA results and for screening of infants at an early age[67]. Many patients (up to 40%) do not return to get their HIV tests results. Where this is a problem rapid HIV tests improve the percentage of patients who get their result to over 99% because it is done while they wait. In fact it has been shown that patients prefer rapid tests[68]. The doctor needs to assess the clinical setting and individual patient's preference when deciding on an HIV screening method.

Most of the harm of screening for HIV is a true positive HIV result as it creates anxiety, tension with close relationships and stigmatisation. ARV treatment has many potential side-effects, the most significant being metabolic disturbance with increased risk of cardiovascular complications. These can be dealt with by changing regimes. The benefits of screening at risk patients definitely outweigh the harms[3]. There is good evidence that monitoring and treating patients detected to have HIV infection by screening with antiretroviral medication, when appropriate, improves their outcome. The progression of HIV disease and mortality is reduced in these patients[3].

It is uncertain what the appropriate duration between normal screening tests should be as research evidence and data on annual HIV incidence is lacking. The CDC recommends annual screening for those at high risk[64]. There is uncertainty about the value of screening adolescents and adults who are not at risk. Although there is evidence that more patients with HIV are detected, the yield is very low. Therefore the potential harms of screening could outweigh the benefits in those not at risk[68].

There is good evidence that routine HIV testing in pregnancy increases the number of women detected with HIV who can then receive treatment antenatally. There is also very good evidence that ARV medication taken before delivery is acceptable to patients and greatly reduces the rate of HIV transmission from mother to baby. Detecting HIV in pregnancy also gives the opportunity to plan an elective caesarean section and recommend avoidance of breast feeding which have been shown to reduce transmission of HIV to the baby. Current ARV regimes are safe for both mother and foetus except for efavirenz which can cause foetal abnormalities. Thus the benefits of screening all pregnant women far outweigh the harms[3].

Recommendations: Screening for HIV infection has become very important in South Africa because of the extremely high infection rates. All patients at risk should be screened with an HIV ELISA or rapid test. A positive result should be confirmed with a second test. The duration between screening tests should be chosen according to each individual patient's ongoing risk of infection. All pregnant women should be screened for HIV.

b) Interview results: Strategies used by GPs in Grahamstown to screen for human immunodeficiency virus (HIV) infection

Most of the GPs interviewed do not routinely screen all adolescents and adults for HIV. They screen in a targeted way by recommending HIV tests to patients they consider at risk or who have symptoms or signs

suggestive of HIV disease. They do not make an assessment of risk by enquiring about the number of sexual partners a patient has or their sexual preferences. Instead they tend to decide who is potentially at risk based on their age and whether the GP knows they have a long term partner or not. The strategies they use are to have a low threshold for recommending tests on patients with any vague symptoms and those presenting with other sexually transmitted diseases. They also state that many patients request HIV tests. These GPs are concerned that recommending HIV tests routinely on all adolescents and adults may result in patients thinking that one is *"insinuating they are promiscuous"*. One GP commented for example that *"to suggest to a farmer who has been married for 15 years he needs to do an HIV test is ridiculous"*. So he recommends HIV tests when he *"deems it appropriate"* or the subject is *"easily broached"*. Thus some GPs are making the decision to screen based on what they know about their patients. Many of the GPs commented how their threshold for testing has got lower over the years and that they more readily recommend HIV tests now than they did a few years ago. Three of the GPs routinely recommend HIV tests on all adolescents and adults. They recommend HIV tests to their patients when they come for PAP smears and routine check ups. One of these GPs screens all sexually active patients because she feels that *"anybody who is sexually active is at risk"*. Another commented that the younger patients are *"not at all fazed"* when she recommends HIV tests. Some of the GPs stated that they do consider the prevalence of HIV infection of the population they are screening when recommending screening such that they *"probably test more frequently"* in high risk populations than low risk. Only one of the GPs recommended annual screening for HIV on his patients. All the others leave the frequency of repeat tests up to their patients. Regarding repeat tests after a negative HIV test, one GP commented that she *"allows them to assess their own risk"* and *"many patients request an HIV test yearly and I don't find that unreasonable"*.

Ten of the GPs screen with an HIV ELISA test. The other GP says she usually does a rapid test because many patients get anxious waiting longer for results. She said, *"The anxiety of even waiting for one night often is too much"*. She does a follow up ELISA if the rapid test result is doubtful or positive. All the GPs screen their pregnant patients for HIV. They all request an HIV as part of the antenatal blood screening tests. All apart from two specifically point out that an HIV test is being done and get consent to include it.

All the GPs noted that many patients do not want to test for HIV and some are reluctant to use ART. However they also noted that HIV screening and treatment is being accepted more and more. One commented that *"generally speaking a lot of patients are still unwilling to do the test"* and that *"I stress confidentiality"* to try and make screening for HIV more acceptable to the patient. All the GPs stress the benefit of HIV testing but do not go into potential harms. Most of the GPs do not counsel their patients fully before testing and one acknowledged that, *"I'm not so good at the counselling"* for HIV testing.

General questions on screening

Interview results: General questions on screening

All the GPs apart from two find there is time to carry out recommended screening. One noted that one has to find the time to fit it in to avoid litigation. Those who do routine annual check ups say these provide ample time to do all recommended screening. The GPs who said they do not have time to carry out recommended screening say they are too busy doing curative work to fit it in their working day. Most of the GPs feel confident about which screening measures to recommend. However three of them commented that they would appreciate some general guidelines relevant to South Africa or an update on evidence regarding screening tests. All the GPs said they get asked by patients to carry out screening tests which they know are not worthwhile. They all tell their patients that the tests are not necessary but if their patients insist, do the tests anyway. One GP stated he tells his patients who ask for unnecessary tests *"it's a waste of time"* but if they insist *"I do them to reassure them".* Another GP said the problem is there are no protocols of what needs to be screened and when. She says this created problems where patients were recommended certain tests by one GP which are not recommended by another, even within the same practice and that this confuses the patients. Another said patients come requesting *"all the tests you can do".* He says he does not debate because then *"you are alienating the patient, you're appearing to be a know all and patients don't like that".* GPs say that patients get the idea these screening tests are necessary from friends, relatives, the internet and magazines.

DISCUSSION

The results show that prevention strategies used by GPs in Grahamstown vary greatly and often do not follow what is recommended. This discussion compares the prevention strategies used by the GPs with the recommendations from the literature.

Routine annual health check

In keeping with research the interviews revealed that most of the GPs strongly recommend an annual routine health check to their patients as it gives him or her time to carry out recommended screening tests. However those GPs who do routine annual check ups tend to have a standard screening strategy rather than focussing on the individual's particular health practices as is recommended[9]. Most are over screening their patients by doing a range of unnecessary tests every year. None of the GPs use check-lists to remind them which screening tests need to be done on each patient despite research showing these to be worthwhile[8]

Some of the GPs do not do routine annual health checks because they practice mostly curative medicine and do not focus on prevention. They tend to perform screening tests in a haphazard way with the result that many of their patients are likely to miss out on recommended screening measures. There are those who do not do routine health checks but screen their patients adequately in a more directed way by targeting the specific risks of each individual (case finding or opportunistic care). However it is important for GPs to be aware that research shows that most patients want these assessments and, while there is not much evidence to show that sub-clinical illness is detected, it has been shown that they reduce patient worry about illness and improve the delivery of important screening tests[10].

Smoking cessation

Similar to other research findings some of the GPs interviewed have negative beliefs and attitudes towards smoking cessation. They feel that such interventions are not worthwhile because patients generally lack motivation to stop smoking[17]. This is despite the fact that there is good evidence that screening and counselling to stop smoking is effective and the benefits outweigh the harms[19]. Although all the GPs I interviewed screen for smoking some only do so if the patient presents with a smoking related illness or signs that they smoke. It has been shown that GPs will fail to identify smokers if they use this strategy[18]. Although all the GPs offer advice to their patients to stop smoking, they spend only a few minutes of a consultation giving this advice despite evidence that the effect of counselling improves the longer one spends giving it[3]. None of the GPs used counselling strategies like motivational interviewing despite there being good evidence that these are effective[18]. Only one of the GPs recommends nicotine replacement therapy despite evidence that it doubles the numbers who stop smoking compared to counselling alone[21]. All the GPs recommend bupropion to assist patients to stop smoking and agree with research that it is effective[22]. Despite evidence showing that the more counselling sessions one has with a patient to specifically address their smoking habit the more likely they will abstain[3], the GPs do not arrange follow up consultations to specifically address their patients' smoking habits.

Screening for breast cancer

Some of the GPs do not screen women for breast cancer although there is good evidence that women screened for breast cancer have a better outcome than unscreened women[25]. All the GPs who screen for breast cancer recommend breast self-examinations although research has shown that breast self-examination does not reduce mortality and increases the number of unnecessary biopsies and therefore the harms out weigh the benefits[24]. All the GPs who screen do annual breast examinations. The varying strategies used by the GPs regarding mammography reflect the varying recommendations in the literature. However there is sufficient evidence that screening with mammography every 3 years from the age of 50 years, which is what most of the GPs are doing, reduces mortality[3], is cost effective[26] and the benefits outweigh the harms[5]. None

of the GPs who screen for breast cancer have a cut off age when they stop referring their patients for mammography despite there being no evidence that screening with mammography beyond the age of 70 years is beneficial[3]. In keeping with evidence that breast cancer screening is more likely to benefit those at high risk[3], the GPs screen these patients at a greater intensity.

Despite recommendations that doctors should involve their patients in decisions about screening by discussing the balance between benefit and harm and the limitations of breast cancer screening[3], none of the GPs does this with their patients. As has been shown in other research the GPs noted that disadvantaged patients tend to get breast cancer screening at a lower rate[23].

Screening for cervical cancer

In keeping with recommendations all the GPs screen with for cervical cancer with PAP smears from the onset of sexual activity or about 20 years of age[3]. However some do not do PAP smears routinely at regular intervals as is recommended but rather erratically only when patients present with gynaecological problems or request PAP smears. Most of the GPs who do routine PAP smears do so annually although research shows that repeating PAP smears every three years is adequate[3]. Although there is limited evidence that screening women older than 65 years who have always had normal PAP smears is worthwhile[3], most of the GPs screen throughout life. One GP includes a vaginal examination when doing PAP smears to screen for ovarian cancer despite there being no evidence to support this[70]. Research has shown that it is advisable to keep a register of patients who require PAP smears and sending reminders encourages women to have regular PAP smears[32], but none of the GPs uses a register or recall system.

Screening for colorectal cancer

Only one GP screens for colorectal cancer which is in keeping with other research which has shown that screening rates for colorectal cancer are poor[44]. This is despite the fact there is good evidence that screening all men and women between the ages of 50 and 75 years reduces mortality from colon cancer[52]. The GPs feel patients find the screening tests like occult blood tests and colonoscopy unacceptable. However research has found that patients find faecal occult blood testing acceptable once the reasons for testing have been explained to them[46]. Patients do find the invasive procedures like sigmoidoscopy and colonoscopy less acceptable and may not be willing to undergo these for screening purposes[46].

Screening for hyperlipidaemia

As is recommended all the GPs interviewed screen for hyperlipidaemia. However 5 of them only screen patients with risk factors for ischaemic heart disease, whereas they should be screening the general population[3]. Most of the GPs use a fasting lipogram to screen for hyperlipidaemia although a random non-fasting cholesterol and HDL are adequate for initial screening. Only if the random cholesterol is elevated is it necessary to do the full fasting lipogram[55]. Most of the GPs are repeating lipograms annually even if these have previously been normal and the patient has no risk factors for ischemic heart disease, which is unnecessary, as it has been found reasonable to screen patients with normal lipograms every 5 years[3]. Although it is unnecessary, the GPs continue screening people over 65 years who have previously had normal tests[3].

Screening for prostate cancer

Despite the fact that there is insufficient evidence to show that the benefits of screening for prostate cancer outweigh the harms[64], most of the GPs interviewed screen for prostate cancer. Although screening is likely to benefit men between 50 and 75 years old the most, some of the GPs screen men as young as 40 years old and none have a cut off age when they stop screening. None of the GPs stops screening men with chronic medical illness and a life expectancy less than 10 years despite the fact these patients are unlikely to benefit from screening and treatment[3]. Despite the fact that screening every 4 years is as beneficial as screening annually[3], almost all the GPs recommend their patients repeat PSA tests every year. Most of the GPs do not do digital

rectal examinations despite research showing that when combined with PSA these improve cancer detection rates[59]. Most of the GPs do not discuss the uncertainty regarding the benefit of prostate cancer screening with their patients so they are unable to make an informed choice of whether to screen or not.

Screening for human immunodeficiency virus (HIV) infection

The GPs interviewed are screening appropriately for HIV infection. The GPs are uncertain how often to repeat HIV tests and mostly leave this up to the patient which is appropriate as evidence is lacking on how frequently one should test. Although the WHO recommends two separate HIV ELISA tests or rapid tests to confirm HIV infection[67], most of the GPs only do one test. Only one GP uses rapid HIV tests routinely to screen for HIV although patients prefer rapid tests and they are now almost as accurate as the HIV ELISA test[68]. Most of the GPs do not do full HIV counselling and are not discussing potential harms of screening before doing the test but rather just stressing the benefits of knowing one's HIV status. It is recommended that the patient makes an informed choice by being given counselling including information on potential benefits and harms[64].

CONCLUSION

The interviews have illustrated that because there are no protocols or guidelines for GPs in private practice they all have differing screening strategies and decide for themselves what to recommend to their patients based on different recommendations and old habits. The spectrum of screening strategies varies from the GP who is doing very little screening to those doing routine "executive" medical examinations where a full range of tests is done every year, both recommended and not recommended. Most of the GPs doing routine annual health checks are recommending additional tests not necessary for routine screening like homocysteine levels[71], renal function tests[5], liver function tests[5], full blood counts[5], lung function tests[3] and stress ECGs[3]. Many of the GPs are pressurised by their patients to do screening tests they know are not worthwhile.

General practitioners need to decide upon a general approach to prevention that will ensure that all their patients are screened according to evidence based recommendations. Routine annual health checks provide an ideal opportunity to carry out all recommended screening. General practitioners who choose to do routine annual check ups need to be aware that these can lead to doctors doing tests which are not recommended and ensure they only do those that are necessary. It is important for the GP to focus on the patients' particular health risks while doing these routine health checks.

It is not necessary to do routine annual health checks to complete recommended screening. But those general practitioners who choose not to do routine annual health checks should be aware that with this approach there is the risk they will not adequately screen all their patients. They need to be sure to provide time for prevention during consultations in order to detect tracer conditions and discuss preventive health issues.
This constitutes a more opportunistic strategy to prevention and case finding. GPs can use both opportunistic and routine health check strategies to ensure recommended screening and prevention is done.

A screening protocol is needed for GPs in private practice so that all doctors are making similar recommendations to their patients. A patient leaflet detailing necessary screening measures with a simple explanation about the benefits and harms of each will reduce patient confusion about what is necessary and assist GPs in helping patients make informed choices regarding screening.

It is advisable for all GPs to keep check lists on each of their patients on what screening measures need to be done (see Addendum 3 for an example of a check list). These check lists will need to be updated as recommendations change. It would be ideal for doctors to keep a register and recall system to ensure all screening measures are done on their patients. However my research has shown that this is not always possible in a busy general practice. It is therefore not unreasonable to leave it up to the patient to remember to attend for their screening measures. GPs need to be aware that disadvantaged patients often do not get screened adequately and make an effort to do what screening is possible for these patients. More research is needed to cover screening in neonates, children, pregnant women, adolescents, the elderly and including alcohol use, diabetes and hypertension in adults to formulate a comprehensive guideline for screening in general practice.

RECOMMENDATIONS

Based on evidence in the literature and the information obtained from interviewing general practitioners in this research study the following are suggested pragmatic prevention strategies for the selected tracer conditions:

Smoking cessation

- GPs should screen all adolescents and adults for smoking whether they have a smoking related illness or not.
- GPs should give smoking cessation advice to all those who smoke. They should try to spend as much time as possible and try to use motivational interviewing techniques when counselling patients to stop smoking.
- GPs should follow up patients they counsel to stop smoking and offer a number of counselling sessions specifically related to smoking.
- GPs should offer medication like bupropion or nicotine replacement therapy to smokers.

Screening for breast cancer

- GPs should screen women routinely for breast cancer but be aware of the limitations and potential harms of breast cancer screening and explain these to patients before they screen.
- It is not necessary for GPs to recommend breast self-examinations but acceptable to teach those who request to learn how to do so. Patients must be informed about the potential harms and taught how to do it properly.
- It is acceptable for GPs to perform annual breast examinations from the age of 30 years.
- Considering cost and benefit versus harm it seems appropriate to screen with mammography women between the ages of 50 and 70 years every 3 years.
- To reduce possible anxiety it is important to warn women before breast examinations and mammography that the majority of lumps detected turn out to be benign.
- High risk patients like those with a family history, first child after 30 years or previous abnormal biopsy of a breast lump, should be screened more intensively, starting at a younger age and more frequently.
- GPs must ensure their disadvantaged patients are screened at least with regular breast examination if they cannot afford mammography.

Screening for cervical carcinoma

- GPs should screen all women routinely for cervical cancer from within 3 years of the onset of sexual activity or 20 years of age, whichever comes first.
- GPs should use PAP smears taken with a cytobrush and extended tip spatula to screen for cervical cancer.
- High risk patients should be screened annually and low risk patients at least every 3 years.
- High risk patients are those who have multiple sexual partners, HIV or HPV infections. If the GP is unable to be sure whether the patient has multiple sexual partners or is HIV positive or not, it is appropriate to screen annually as if the patient is high risk initially and extend the intervals between screenings once the GP is sure the patient is no longer high risk.
- In women who have always had normal PAP smears, screening can be stopped after 65 years of age.

Screening for colorectal cancer

- GPs should screen all patients from the age of 50 to 75 years with annual faecal occult blood testing.
- GPs should recommend sigmoidoscopy every 5 years and colonoscopy every 10 years on all patients from 50 years to 75 years of age.

- GPs should explain the reasons for testing to encourage patients to accept the screening measures.
- GPs should refer patients at increased risk of colon cancer to specialists for more intensive screening.
- Those at high risk are patients with a family history of colorectal cancer, familial polyposis and ulcerative colitis.
- Those with a family history of colorectal cancer should start screening at age 40 years and where the relative developed the cancer younger than 50 years, 10 years before the age the family member developed the cancer.

Screening for hyperlipidaemia

- GPs should routinely screen all men from the age of 35 years and all women from the age of 45 years for hyperlipidaemia.
- Random non-fasting cholesterol and HDL are adequate for initial screening.
- A full fasting lipogram should be done if the random cholesterol is elevated.
- If the patient has no risk factors for ischemic heart disease and a normal lipogram the GP only needs to repeat screening every 5 years.
- Patients with no risk factors and normal lipograms do not need screening beyond 65 years of age.
- Patients with risk factors for ischemic heart disease need to start screening at a younger age.
- Patients with risk factors for ischemic heart disease or who take treatment for hyperlipidaemia need repeat lipograms annually.
- Treatment should be offered to those at increased risk of coronary heart disease.

Screening for prostate cancer

- GPs need to be aware that there is insufficient evidence to show that the benefits of screening for prostate cancer outweigh the harms and point this out to their patients so that they can make an informed choice regarding screening. Patients need to know that the PSA and DRE can detect some cases of prostate cancer but there is no clear evidence that patients detected by screening have a better outcome than those detected when they present with symptoms.
- If a patient chooses to be screened for prostate cancer a PSA test and DRE every 4 years between the ages of 50 and 75 years is appropriate.
- GPs need to be aware that screening results in many false positive and false negative outcomes.
- Prostate cancer screening in men over 75 years old or with chronic medical illness and a life expectancy less than 10 years is not recommended.
- GPs need to be aware that it is unclear what the appropriate management is for patients detected by screening.

Screening for human immunodeficiency virus (HIV) infection

- GPs need to enquire about risk factors for HIV so they are aware who to screen.
- GPs should consider screening all adolescents and young adults whether they have specific risk factors or not.
- GPs should be aware that the potential harms of screening those not at risk could outweigh the benefits. Thus if the patient is certain they are not at risk HIV testing should not be done.
- GPs should consider the prevalence of HIV infection in the population they serve when deciding who to screen.
- High risk patients should be tested annually.
- Low risk patients can repeat the test when they feel it is warranted.
- GPs should consider doing rapid HIV tests to screen patients.
- If the HIV rapid test is positive the GP should either repeat a second separate rapid test or do an ELISA to confirm the result.

- GPs should screen all pregnant women for HIV.
- GPs should counsel patients including discussing potential benefits and harms before doing HIV tests so that patients can make an informed decision about whether to test or not.

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REFERENCES

1. Kochanek KD, Hudson BL. Advance report of final mortality statistics, 1992. Monthly vital statistics report, Vol 43, no 6, suppl. Hyattsville, MD, National Centre for Health Statistics, 1995.
2. Canadian Task Force on the Periodic Health Examination. The Canadian Guide to Preventative Health Care. Ottawa, Canada Communication Group, 1994
3. United States Preventative Services Task Force: http://www.ahcpr.gov/clinic/uspstfix.htm
4. Ashley B, Coffield AB. Priorities among recommended clinical preventive services. Am J Prev Med. 2001; 21 (1) 1-9.
5. Smith HE, Herbert CP. Preventive practice among primary care physicians in British Columbia: relation to recommendations of the Canadian Task Force on the Periodic Health Examination. Can Med Assoc J. 1993; 149 (12) 1795-1800.
6. Strange KC, Flocke SA, Goodwin MA, Kelly RB, Zyzanski SJ. Direct observation of rates of preventive service delivery in community family practice. Preventive Medicine. 2000 31(2) 167-176.
7. Dubey V, Glazier R. Preventive Care Checklist Form. Evidence-based tool to improve preventive health care during complete health assessment of adults. Can Fam Physician. 2006 January 10; 52(1): 48–55.
8. Dubey V, Mathew R, Iglar K, Moineddin R, Glazier R. Improving preventive service delivery at adult complete health check-ups: the Preventive health evidence-based recommendation form (PERFORM) cluster randomized controlled trial. BMC Family Practice. 2006; 7 (44) 1-12.
9. Wender RC. Cancer screening and prevention in primary care. Obstacles for physicians. CANCER. 1993; 72 (3) 1093-1099.
10. Yarnall KSH, Pollak KI, Ostbye T, Krause KM, Michener JL. Primary care: Is there enough time for prevention? Am J of Public Health. 2003; 93(4) 635-641.
11. Pimlott N. Preventive care: so many recommendations, so little time. Canadian Medical Association Journal. 2005; 173 (11).
12. Prochazka AV, Lundahl K, Pearson W, Oboler SK, Anderson RJ. Support of evidence-based guidelines for the annual physical examination: a survey of primary care providers. Arch Intern Med. 2005; 165(12) 1347-1352.
13. Marinopoulos S, Phillips KA, Hwang CW, Maynor K, Merenstein D, Wilson RF, Barnes GJ, Bass EB, Powe NR, Daumit GL. Systematic review: the value of the periodic health evaluation. Ann Intern Med. 2007 Feb 20; 146(4):289-300.
14. Wilson JMG, Junger G. Principles and practice of screening for disease. Geneva: World Health Organization, 1968.
15. R.Edwards The problem of tobacco smoking. ABC of smoking cessation 2004 Ch.1-3:

16. Groenewald P, Vos T, Norman R, Laubscher R, van Walbeek C, Saloojee Y, Sitas F, Bradshaw D; South African Comparative Risk Assessment Collaborating Group. Estimating the burden of disease attributable to smoking in South Africa in 2000. S Afr Med J. 2007 Aug; 97(8 Pt 2):674-81.
17. Vogt F, Hall S, Marteau TM. General practitioners' and family physicians' negative beliefs and attitudes towards discussing smoking cessation with patients: a systematic review. Addiction. 2005 Oct;100(10):1423-31
18. Zwar NA, Richmond RL Role of the general practitioner in smoking cessation. Drug Alcohol Rev. 2006 Jan;25(1):21-6
19. Lancaster, T. and Stead, L. (2004) Physician advice for smoking cessation. Cochrane Database Syst Rev
20. Zwar N, Richmond R, Borland R, Stillman S, Cunningham M, Litt J. Smoking cessation guidelines for Australian general practice. Aust Fam Physician. 2005 Jun; 34(6):461-6...
21. Silagy, C., Lancaster, T., Stead, L., Mant, D. and Fowler, G. (2004) Nicotine replacement therapy for smoking cessation [Review]. Cochrane Database Syst Rev p. CD000146.
22. Roddy E. Bupropion and other non-nicotine pharmacotherapies. ABC of Smoking Cessation. Blackwell publishing 2004. Ch 6 (15-17) (also bmj.com)
23. Anim JT Breast cancer in sub-Saharan African women. Afr J Med Med Sci. 1993 Mar;22(1):5-10.
24. Baxter N; Canadian Task Force on Preventive Health Care. Preventive health care, 2001 update: should women be routinely taught breast self-examination to screen for breast cancer? CMAJ. 2001 Jun 26;164(13):1837-46
25. Advisory Committee on Breast Cancer Screening. Screening for breast cancer in England: past and future. J Med Screen. 2006; 13(2):59-61.
26. Elixhauser A. Costs of breast cancer and the cost-effectiveness of breast cancer screening. Int J Technol Assess Health Care. 1991; 7(4):604-15.
27. Stout NK, Rosenberg MA, Trentham-Dietz A, Smith MA, Robinson SM, Fryback DG. Retrospective cost-effectiveness analysis of screening mammography. J Natl Cancer Inst. 2006 Jun 7; 98(11):774-82.
28. Okonkwo QL, Draisma G, der Kinderen A, Brown ML, de Koning HJJ. Breast cancer screening policies in developing countries: a cost-effectiveness analysis for India. Natl Cancer Inst. 2008 Sep 17;100(18):1290-300. Epub 2008 Sep 9
29. EBM Guidelines 2008 Pap (cervical) smear and endometrial biopsy http://ebmg.wiley.com.ez.sun.ac.za/ebmg/ltk.koti
30. FIGO 6th Annual Report on the Results of Treatment in Gynecological Cancer.Denny L.Groote Schuur Hospital, Dept. of Gynaecological Oncology, H 45 OMB, Observatory, 7925 Cape Town, South Africa. Cervical cancer: the South African perspective. Int J Gynaecol Obstet. 2006 Nov; 95 Suppl 1:S211-4.
31. Fahey M T, Irwig L, Macaskill P. Meta-analysis of Pap test accuracy. American Journal of Epidemiology 1995; 141(7): 680-689
32. Pirkis J E, Jolley D, Dunt D R. Recruitment of women by GPs for Pap tests: a meta-analysis. British Journal of General Practice 1998; 48: 1603-16076
33. Jin XW, Zanotti K, Yen-Lieberman B. New cervical cancer screening strategy: combined Pap and HPV testing.. Cleve Clin J Med. 2005 Feb; 72(2):141-147
34. Schiffman M et al. Human papillomavirus and cervical cancer. Lancet 2007; 370:890-907
35. Martin-Hirsch P, Jarvis G, Kitchener H, Lilford R. Collection devices for obtaining cervical cytology samples. Cochrane Database Syst Rev. 2000; (3):CD001036
36. Arbyn M, Bergeron C, Klinkhamer P, Martin-Hirsch P, Siebers AG, Bulten J. Liquid compared with conventional cervical cytology: a systematic review and meta-analysis. Obstet Gynecol. 2008 Jan; 111(1):167-77
37. Cronjé HS. Screening for cervical cancer in the developing world. Best Pract Res Clin Obstet Gynaecol. 2005 Aug; 19(4):517-29. Epub 2005 Mar 26.

38. Mandelblatt JS, Lawrence WF, Gaffikin L, Limpahayom KK, Lumbiganon P, Warakamin S, King J, Yi B, Ringers P, Blumenthal PD. Costs and benefits of different strategies to screen for cervical cancer in less-developed countries. J Natl Cancer Inst. 2002 Oct 2; 94(19):1469-83.
39. Benson AB. Epidemiology, disease progression, and economic burden of colorectal cancer. J Manag Care Pharm. 2007 Aug; 13(6 Suppl C):S5-18.
40. Walker AR, Segal I. Colorectal cancer in an African city population in transition. Eur J Cancer Prev 2002 April: 11(2): 187-191
41. Anderson WF, Umar A, Brawley OW. Colorectal carcinoma in black and white race. Cancer Metastasis Rev. 2003 Mar; 22(1):67-82.
42. Walsh JM, Terdiman JP. Colorectal cancer screening: scientific review. JAMA. 2003 Mar 12; 289(10):1288-96.
43. Wilkins T, Reynolds PL. Colorectal cancer: a summary of the evidence for screening and prevention. Am Fam Physician. 2008 Dec 15; 78(12):1385-92.
44. Wolf MS, Satterlee M, Calhoun EA, Skripkauskas S, Fulwiler D, Diamond-Shapiro L, Alvarez H, Eder M, Mukundan P. Colorectal cancer screening among the medically underserved. J Health Care Poor Underserved. 2006 Feb;17(1):47-54.
45. Ling BS, Schoen RE, Trauth JM, Wahed AS, Eury T, Simak DM, Solano FX, Weissfeld JL Physicians encouraging colorectal screening: a randomized controlled trial of enhanced office and patient management on compliance with colorectal cancer screening.Arch Intern Med. 2009 Jan 12; 169(1):47-55.
46. The multicentre Australian colorectal-neoplasia screening group. A comparison of colorectal neoplasia screening tests: a multicentre community-based study of the impact of consumer choice. Med J Aust. 2006 Jun 5; 184(11):546-503.
47. Bond JH. Fecal occult blood test screening for colorectal cancer. Gastrointest Endosc Clin N Am. 2002 Jan; 12(1):11-21.
48. Atkin W. Options for screening for colorectal cancer. Scand J Gastroenterol Suppl. 2003; (237):13-6.
49. Zlobec I, Lugli A. Prognostic and predictive factors in colorectal cancer. Postgrad Med J. 2008 Aug; 84(994):403-11
50. UK Colorectal cancer screening pilot group. Results of the first round of a demonstration pilot of screening for colorectal cancer in the United Kingdom. BMJ. 2004 July 17:329(7458):133.
51. M.V.Maciosek, L.I.Solberg, A.B.Coffield, N.M.Edwards, M.J.Goodman. Colorectal cancer screening health impact and cost effectiveness. Am J Prev Med. 2006 Jul: 31(1):80-89..
52. Frazier AL, Colditz GA, Fuchs CS, Kuntz KM. Cost-effectiveness of screening for colorectal cancer in the general population. JAMA. 2000; 284:1954-1961
53. Raal FJ. Management of dyslipidaemia. CME July 2003 21(7):378-382
54. Blom DJ, Firth JC. Clinical approach to dyslipidaemia. CME July 2003 21(7):370-377.
55. Vermaak WJH. The laboratory assessment of lipid disorders. CME July 2003 21(7):391-397.
56. Seftel H. Dyslipidaemia in South Africa: A historical perspective. CME July 2003 21(7):398-399
57. Parkin DM, Sitas F, Chirenje M, Stein L, Abratt R, Wabinga H. Part I: Cancer in Indigenous Africans--burden, distribution, and trends. Lancet Oncol. 2008 Jul; 9(7):683-92
58. Botchorishvili G, Matikainen MP, Lilja H. Early prostate-specific antigen changes and the diagnosis and prognosis of prostate cancer. Curr Opin Urol. 2009 May; 19(3):221-6.
59. Catalona WJ, Richie JP, Ahmann FR, Hudson MA, Scardino PT, Flanigan RC, deKernion JB, Ratliff TL, Kavoussi LR, Dalkin BL, et al. Comparison of digital rectal examination and serum prostate specific antigen in the early detection of prostate cancer: results of a multicenter clinical trial of 6,630 men. J Urol. 1994 May;151(5):1283-90..
60. Carvalhal GF, Smith DS, Mager DE, Ramos C, Catalona WJ Digital rectal examination for detecting prostate cancer at prostate specific antigen levels of 4 ng./ml. or less. J Urol. 1999 Mar;161(3):835-9
61. Pienta KJ. Critical appraisal of prostate-specific antigen in prostate cancer screening: 20 years later. Urology. 2009 May; 73(5 Suppl):S11-20.

62. Ilic D, O'Connor D, Green S, Wilt T. Screening for prostate cancer. The Cochrane Library. Cochrane review. http://www.cochrane.org/reviews/en/ab004720.html
63. AVERT. Sub-Saharan Africa HIV/AIDS statistics, 2005. Available at: http://www.avert.org/subaadults.htm. Accessed 17 March 2007.
64. Centers for Disease Control and Prevention. Revised recommendations for HIV testing of adults, adolescents, and pregnant women in health-care settings. MMWR 2006;55(RR-14):1-17
65. Walensky RP, Freedberg KA, Weinstein MC, Paltiel AD. Cost-effectiveness of HIV testing and treatment in the United States. Clin Infect Dis. 2007 Dec 15;45 Suppl 4:S248-54
66. Cordes RJ, Ryan ME. Pitfalls in HIV testing. Application and limitations of current tests. Postgrad Med. 1995 Nov;98(5):177-80, 185-6, 189.
67. Martin D, Sim J. The laboratory diagnosis of HIV infection. S Afr Med J. 2000 Feb; 90(2):105-9.
68. Patrick A. Keenan, MD Joseph M. Keenan, MD Bernard M. Branson, MD. Rapid HIV testing. Postgrad Med. 2005 Mar; 117(3):47-52
69. Harris RP, Helfand M, Woolf SH, et al. Current methods of the third U.S. Preventive Services Task Force. Am J Prev Med 2001; 20(3S):21-35
70. Daniel L, Clarke-Pearson M.D. Screening for Ovarian Cancer. N Engl J Med. 2009 Jul 9; 361(2):170-7.
71. Faeh D, Chiolero A, Paccaud F. Homocysteine as a risk factor for cardiovascular disease: should we (still) worry about? Swiss Med Wkly. 2006 Dec 2; 136(47-48):745-56.

ADDENDUM 1. Structured questionnaire for GP interviews

PERIODIC HEALTH EXAMINATION / ROUTINE ANNUAL CHECK-UP

Do you recommend routine medical examinations to your patients?

If no:
Why don't you recommend routine medical examinations?
When or how do you screen for preventative tracer conditions?

If yes:
From what age do you recommend these check-ups?
How often do you recommend patients have routine health checks?
How do you remember to carry out routine examinations? Do you keep a register or check list?
What do you screen for in these health checks?
What is your opinion on the value of these assessments?
What illnesses do you detect during these examinations?
Do you focus interventions on the individual's particular health practices or do you have a standard screening strategy?
Do you discuss preventative health issues during this examination and if so which?
Do patients demand routine health examinations?
Do you involve your patients in decisions about routine examinations by discussing potential benefits, harms and implications?
Do you feel the cost is justified?
Do periodic health examinations improve your relationship with your patient?
Do your more disadvantaged patients tend to get this preventive service at a lower rate?
What obstacles or barriers do you encounter doing these examinations? (Doctor/patient/health system)

SMOKING CESSATION

Do you screen your patients for smoking?

If no:
Why don't you screen for smoking?

If yes:
What strategy do you use to screen for smoking?
(When and how do you screen for smoking?)

Do you offer counselling for smoking cessation and if so what strategy do you use?
(Do you use motivational interviewing to encourage smoking cessation?)
Do you tend to give smoking cessation advice only or mainly when the patient presents with a smoking related problem?
How long do you spend on smoking cessation advice?
Do you advise patients to use nicotine replacement therapy or bupropion to help with smoking cessation?
Do you follow up patients you counsel for smoking cessation? If so how many sessions do you have with them?
Do you feel smoking cessation interventions are effective?
Do you find it difficult to remember to screen for smoking? Do you use a check list to remind you?
What are your views on and experiences of screening and counselling for smoking?

(Do you encounter any obstacles or barriers to screening and counselling for smoking?)
Do you feel patients in general lack motivation to stop smoking?
Do you find discussions about smoking unpleasant?
Do you find them too time consuming?

SCREENING FOR BREAST CARCINOMA

Do you screen for breast cancer?

If no:
Why don't you screen for breast cancer?

If yes:
What screening strategy do you use for breast cancer?
Do you teach your patients and recommend they do routine breast self examinations?
Do you do routine clinical breast examinations?
Do you refer patients for mammography?
What age do you start breast cancer screening/mammography?
What ages do you stop breast cancer screening/ mammography?
How frequently do you screen for breast cancer?
Do you keep a check list or register?
Do you involve your patients in decisions about screening?
Do you discuss potential benefits, limitations, and possible harms of mammography with patients before referring for the procedure?
Do your patients find the screening measures of breast cancer acceptable?
What are your views on and experiences of screening for breast cancer?
Do you encounter any obstacles to screening for breast cancer? (Doctor / patient / health system)
Do your more disadvantaged patients tend to get screened for breast cancer at a lower rate?

SCREENING FOR CERVICAL CARCINOMA

Do you screen for cervical cancer?

If no:
Why don't you screen for cervical cancer?

If yes:
What screening strategy do you use for detecting cervical carcinoma?
- What screening measure/s do you use?
- At what age do you recommend women start doing PAP smears?
- How often do you recommend patients repeat PAP smears if their results are normal?
- At what age do you recommend women stop doing PAP smears?

Do you involve your patients in decisions about screening?
Do you do the PAP smears or does a nursing sister do them?
What device do you use for obtaining specimens?
Do you use liquid based cytology or smear technology? Why?
Do you do HPV tests as part of screening for cervical carcinoma?
Do you keep a register or use patient reminders?
Who do you regard high risk and how often do you screen them?

Do your patients find PAP smears acceptable?
Do your female patients avoid or delay having PAP smears?
Do you encounter any obstacles screening for cervical carcinoma?
What are your views on and experiences of screening for cervical carcinoma?

SCREENING FOR COLORECTAL CANCER

Do you screen for colorectal cancer?

If no:
Why don't you screen for colorectal cancer?

If yes:
What screening strategy do you use?
What tests do you recommend?
From what age do you recommend patients undergo these tests? Until what age?
How often do you recommend they have these screening tests?

Who do you consider high risk patients and what screening strategy do you recommend for these patients?
Do you have a register and recall system?
Do you sometimes forget to offer screening?
Would you consider your screening rate high or low?
Are patients reluctant to undergo screening tests?
Do you involve your patients in decisions about screening?
What are your views on and experiences of colorectal cancer screening?
Do you encounter any obstacles screening for colorectal cancer?
Do people from lower socio-economic communities get screened less?

SCREENING FOR HYPERLIPIDAEMIA

Do you screen for hyperlipidaemia?

If no:
Why don't you screen for hyperlipaemia?

If yes:
What screening strategy do you use for hyperlipidaemia?

Which tests do you use?
At what age do you start and until what age do you recommend screening for hyperlipidaemia?
What interval do you recommend between screenings for those not at risk with normal results / those at risk/ those with abnormal results?
Do you keep a register or have a recall system?
Do your patients find the treatment of hyperlipidaemia acceptable?
Do you discuss the advantages and disadvantages of screening and treatment?
What are your views on and experiences of screening for hyperlipidaemia?
Do you encounter any obstacles screening for hyperlipidaemia?
Do you feel patients generally are reluctant to heed advice regarding leading healthy lifestyles?
Do your more disadvantaged patients tend to screen for hyperlipidaemia at a lower rate?

SCREENING FOR HUMAN IMMUNODEFICIENCY VIRUS INFECTION

Do you screen for HIV infection?
If no:
Why don't you screen for HIV infection?

If yes:
What strategy do you use to screen for HIV infection?

Do you routinely screen all adolescents and adults or only those at increased risk?
If you only screen those at increased risk what factors do you consider increased risk?
How do you assess for risk?
Do you consider the prevalence of HIV infection or the risk characteristics of the population when determining a screening strategy?
How frequent do you recommend HIV tests?
What tests do you use to screen for HIV infection?
Do you keep a check list or register?
Do you screen all pregnant women for HIV?
Do you do the tests as part of antenatal blood tests without specifically getting consent?
Do those at risk find the screening measure and/or treatment acceptable?
Do you discuss potential benefits and harms of HIV testing?
Do you involve your patients in decisions about screening?
What barriers or obstacles do you experience in carrying out screening? (Doctor/ patient/ health system)

SCREENING FOR PROSTATE CANCER

Do you screen for cancer of the prostate?
If no:
Why don't you screen for prostate cancer?
If yes:
What screening strategy do you use?

What age do you recommend starting screening for prostate cancer?
Up until which age do you screen for prostate cancer?
Do you exclude any patients from screening?
How frequently do you recommend testing?
What tests do you recommend?
Do you keep a check list or register?
Do you involve your patients in decisions about screening? / Do you discuss the benefits and harms of screening and treatment before making recommendations?
What barriers or obstacles do you experience in carrying out screening? (Doctor/ patient/ health system)
Do those at risk find the screening measures and treatment of prostate cancer acceptable?
Do your more disadvantaged patients tend to screen for prostate cancer at a lower rate?

GENERAL QUESTIONS

Do you find you have time to carry out recommended screening?
Do you feel confident about which screening measures to recommend?
Do you tend to recommend well established traditional screening measures?
Do you use newly recommended screening measures?

Do you discuss prevention at every consultation? If not when do you discuss prevention?
Do you find it too time consuming to explain the evidence regarding a given screening procedure?
Do you get pressurised by patients to carry out a preventive measure that is not worthwhile? Which?

CONCLUSION

Do you have anything you would like to add regarding the prevention strategy you use for the above preventive measures?
Do you have anything you would like to add about preventive strategies in general?
Thank you for your participation in my research.

ADDENDUM 2. Informed consent to conduct interviews

PARTICIPANT INFORMATION LEAFLET AND CONSENT FORM

TITLE OF THE RESEARCH PROJECT: Evaluating prevention strategies used by general practitioners in terms of recommended guidelines.

REFERENCE NUMBER: N08/06167
PRINICIPAL INVESTIGATOR: Dr M.D.Godlonton
ADDRESS: 41 Hill Street Grahamstown
CONTACT NUMBER: 0828515480

You are being invited to take part in a research project. Please take some time to read the information presented here, which will explain the details of this project. Please ask the study doctor any questions about any part of this project that you do not fully understand. It is very important that you are fully satisfied that you clearly understand what this research entails and how you could be involved. Also, your participation is entirely voluntary and you are free to decline to participate. If you say no, this will not affect you negatively in any way whatsoever. You are also free to withdraw from the study at any point, even if you do agree to take part.

This study has been approved by the Committee for Human Research at Stellenbosch University and will be conducted according to the ethical guidelines and principles of the international Declaration of Helsinki, South African Guidelines for Good Clinical Practice and the Medical Research Council (MRC) Ethical Guidelines for Research.

What is this research study all about?
This study will be conducted in Grahamstown. All general practitioners in private practice in Grahamstown will be invited to participate in the study.
The aim of the study is to evaluate the prevention strategies used by general practitioners (GPs) in Grahamstown in terms of the recommended guidelines for appropriate tracer conditions. By tracer conditions I mean diseases which can be detected and treated early by screening measures or prevention strategies, rather than wait for presentation later when there are obvious symptoms or signs. I am doing the study because prevention is an important part of family practice but constraints on consultation time and medical funds makes it difficult to be sure which measures are appropriate and when to carry them out. I want to find out what prevention strategies GPs in Grahamstown practice and their views and obstacles experienced carrying these out. I then want to compare the prevention strategies used by GPs with recommended guidelines. Finally I hope to use all this information to make recommendations for successful screening in general practice in Grahamstown.

I have invited you as a general practitioner in private practice to participate because your views and approach to preventive measures and obstacles you experience carrying them out are very important to this study. This information will help to identify important issues on preventive screening in private practice.

What will your responsibilities be?
I will make an appointment with you to conduct an interview which will last about an hour. In the interview I will you ask you about the preventive strategies for certain tracer conditions you use in your clinical practice and your views and obstacles you experience regarding these preventive measures. I would like to record the interviews. If you feel uncomfortable being recorded I can make written notes on your responses.

Will you benefit from taking part in this research?

You may benefit from the exercise of analysing the preventive strategy you use in your practice. Hopefully the research will help general practitioners in private practice improve their screening strategies for their patients.

Who will have access to your interviews?
Only I will have access to your interviews. I will conduct all the interviews and transcribe the recordings for analysis. No names will be linked to the data and interviews will be destroyed after analysis. All information you give me will be treated as confidential and will be protected. Reporting on data will be done anonymously. Data will be analysed qualitatively. Themes or patterns of practice and similar ideas or obstacles will be grouped together. Thus once analysed for reporting data will not resemble the original interviews and not be linked to individuals.

Is there any thing else that you should know or do?
You can contact the Committee for Human Research at 021-938 9207 if you have any concerns or complaints that have not been adequately addressed by your study doctor.
You will receive a copy of this information and consent form for your own records.

By Signing below,

I…… agree to take part in a research study entitled: Evaluating prevention strategies used by general practitioners in terms of recommended guidelines.

I declare that:
· I have read or had read to me this information and consent form and it is written in a language with which I am fluent and comfortable.
· I have had a chance to ask questions and all my questions have been adequately answered.
· I understand that taking part in this study is voluntary and I have not been pressurised to take part.
· I may choose to leave the study at any time and will not be penalised or prejudiced in any way.
· I may be asked to leave the study before it has finished, if the study doctor or researcher feels it is in my best interests, or if I do not follow the study plan, as agreed to.

Signed at …… ……on ……..... 2009

…… .. ……
……..
Signature of Participant Signature of witness

Declaration by Investigator
I …….. declare that:-
· I explained the information in this document to ……....
· I encouraged him/her to ask questions and took adequate time to answer them.
· I am satisfied that he/she adequately understands all aspects of the research, as discussed above
· I did not use a translator.

Signed at ……on …….2009

…… .. …… ……
Signature of Investigator Signature of Witness.

ADDENDUM 3. Check list for adult screening

HISTORY

1. Diet and weight loss counselling if necessary
2. Exercise
3. Sun exposure education
4. Safe sex and STD education
5. Females of childbearing age: folic acid
6. Family history of illness

HABITS

1. Smoking –yes or no
If yes:
- smoking cessation advice/counselling
- nicotine replacement or bupropion
- follow up

2. Alcohol –yes or no
If yes:
- case finding for problem drinking
- counselling for problem drinking

PHYSICAL EXAMINATION

Full physical examination including waste circumference, hip / waste ratio, weight, height and BMI

SPECIAL INVESTIGATIONS

Random cholesterol or fasting lipogram (men >35 years / women >40 years or younger if at risk)
- Repeat annually if other risk factors
- Repeat every 5 years if no other risk factors

Fasting glucose (men >35 years / women >40 years or younger if at risk)
- Repeat annually if at risk
- Repeat every 5 years if no risk

HIV test
- Repeat annually if high risk

Colorectal cancer (50 to 75 years)
- Stool occult blood annually
- Sigmoidoscopy every 5 years
- Colonoscopy every 10 years
- Refer high risk for intensive screening

Cervical cancer (female sexually active or 20 to 65 years)
- PAP smear annual if high risk

- PAP smear every 3 years if low risk and previously normal

Breast cancer (female 50 to 70 years)

- Breast examination annual
- Mammogram every 3 years

Prostate cancer (men 50 to 75 years)

- PSA and DRE every 4 years